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THE SACRO-ILIAC JOINT AND PAIN OF SCIATIC RADIATION

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The cause of pain of sciatic radiation has long been a subject of investigation, and the causative factors advanced for this condition are legion. My interest was drawn to the role of the sacro-iliac joint in its relation to the components of the sacral plexus by the high incidence in anatomic specimens of hypertrophic arthritic changes with spur formation in the region of the anterior surface of the joint, particularly in the area traversed by the lumbosacral trunk. It is my purpose in this paper to present the anatomy of this region and the data relating to the arthritic changes in the sacro-iliac joint as determined by dissections on 64 cadavers.

The involvement of the lumbosacral trunk by disease of the sacro-iliac joint due to their close anatomic relationship was first demonstrated in 1861 by John Hilton [1] in his lectures to the Royal College of Surgeons, at which time he presented a clinical case which he ascribed to this condition. In 1905 Goldthwait and Osgood [2] discussed arthritis of the sacro-iliac joint, both its atrophic and its hypertrophic forms, the latter being, in their opinion, far more common. These authors believed that the referred pains in this condition were "undoubtedly due to pressure of the hypertrophic tissue upon the lumbosacral cord as it passes over the articulation." Albee [3] in 1909 dissected the sacro-iliac region of 50 specimens and concluded that the proximity of the lumbosacral trunk to the joint in its lower one third explained the presence of persistent pain in the distribution of the sciatic nerve. In 1925 Danforth and Wilson [4] described the anatomy of the region as observed in 12 cadavers. They believed that nerve pain due to joint disturbance might be produced at the point at which the fourth and fifth lumbar nerves cross the sacro-iliac joint at its lower margin, although it was their opinion that such involvement is more likely to take place in the lumbosacral region owing to the enclosure of the nerves in the bony intervertebral foramens. Yeoman [5] in 1928 presented 100 clinical cases of sciatica, 36 per cent of which he attributed to arthritis of the sacro-iliac joint as demonstrated by roentgenograms of the joint. However, he described the pyriformis muscle as lying between the lumbosacral trunk and the joint at its lower margin and attributed sciatica as being produced in these cases by a periarthritis involving the anterior sacro-iliac ligament and pyriformis muscle and the latter involvement in turn affecting the sciatic nerve. This anatomic relationship was not found in any of the dissections in the present study, as will be discussed later. In 1930 Sashin,[6] basing his work on 257 postmortem examinations in which both sacro-iliac joints were removed, emphasized that nothing except the thin anterior portion of the joint capsule intervenes between the lumbosacral trunk and the joint space. Reviewing 1,559 human skeletons in the Hamann Museum of Anthropology, Willis [7] in 1933 noted the high incidence of bone changes in the sacro-iliac joint. In 1934 Freiberg and Vinke [8] referred to Yeoman's work and emphasized his description of the pyriformis muscle lying between the lumbosacral trunk and the joint. They believed that the irritated pyriformis was responsible for sciatica in some instances and based their opinion on their dissections on 14 cadavers. Casuccio [9] in 1938, studying 16 unembalmed bodies, affirmed the direct and constant relationship of the lumbosacral trunk to the sacro-iliac joint.

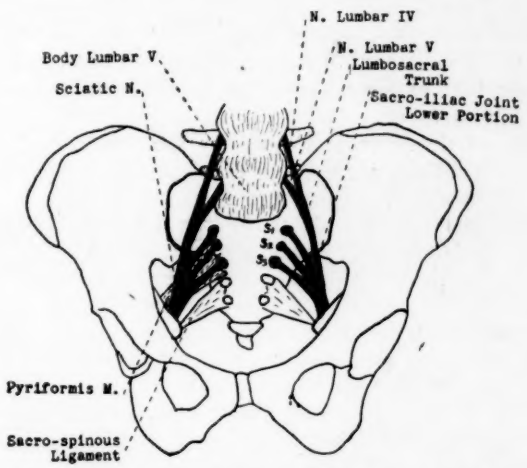

Fig. 1.—Diagram of pelvis, showing formation of sacral plexus with lumbosacral trunk passing over lower sacro-iliac joint.

Dr. Rollo E. McCotter, professor of anatomy, assisted the author in this study.

From the Departments of Anatomy and Surgery, University of Michigan Medical School.

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ANATOMY

As illustrated in figure 1, the anterior portion of the sacro-iliac joint produces a curving line which swings most lateralward in the region of the ala of the sacrum and then passes downward and medially at its lowermost end. The joint is covered anteriorly by the anterior sacro-iliac ligament, which is a very thin structure of little strength. It is through this weak anterior capsule that exudate breaks in suppurative sacro-iliac joint disease.

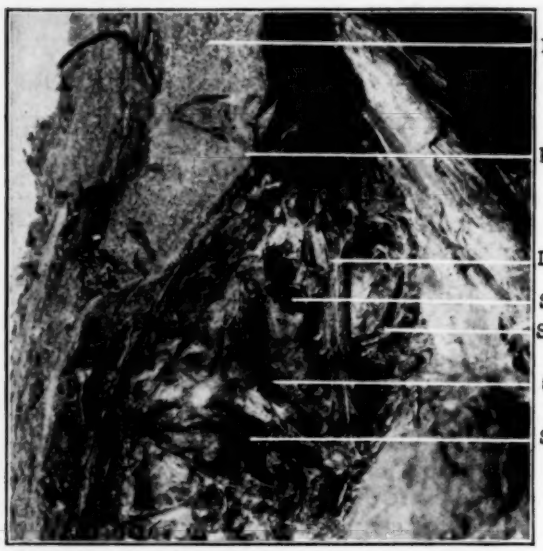

Fig. 2.—Appearance of dissection of pelvis, showing lumbosacral trunk forced to angulate over hypertrophic lipping of lower one third of sacro-iliac joint.

The sciatic nerve is formed by the fourth and fifth lumbar and first, second and third sacral nerves. The fourth lumbar nerve splits into a larger upper segment which contributes to the lumbar plexus and a smaller lower segment which passes downward to unite with the fifth lumbar nerve over the ala of the sacrum. This point of union is not constant and may occur at a slightly higher or lower level. The nerve trunk thus formed is the lumbosacral trunk, which courses downward, lying on the anterior surface of the sacrum just medial to the sacro-iliac joint until the lower one third of that articulation is reached, where the joint line passes medially. There the lumbosacral trunk crosses the joint and lies directly on the capsule. In very broad pelves the trunk may remain medial to the joint, but this was not seen in any of the 64 bodies examined. Although the pyriformis may have a few fibers of origin from the very lowermost portion of the capsule of the sacro-iliac joint, it always occupied a medial position to the lumbosacral trunk at the level at which the latter traversed the joint in all of our specimens.

The first, second and third sacral nerves pass laterally from their respective foramens anterior to the pyriformis and unite with the lumbosacral trunk to form the sacral plexus. The hypogastric vessels lie anteriorly to the sacral plexus with the superior gluteal vessels passing between the trunk and the first sacral nerve (fig. 2) to leave the pelvis through the suprapyriformic space. The inferior gluteal vessels pass between the second and the third sacral nerve to reach the thigh through the infrapyriformic space.

COMMENT

In the present study the anterior sacro-iliac regions of 64 embalmed bodies were dissected. The relationship of the lumbosacral trunk to the sacro-iliac joint was determined in all specimens and the degree of arthritic lipping of the joint was noted and classified as to severity. In all specimens the lumbosacral trunk crossed the lower one third of the sacro-iliac joint and lay directly on the joint.

The observations relative to the arthritic changes in the joint are contained in table 1. It appears significant that 25 per cent of the bodies examined showed well defined lipping of the joint anteriorly. In many of these the joint line was extremely rough and jagged and in most of the cases the lumbosacral trunk was pushed forward and was forced to angulate over this process, as shown in figures 2 and 3. Indeed in at least 2 of the specimens there was an actual groove in the posterior surface of the trunk at the point at which it was in contact with the joint. Sashin suggested that such a process might affect the nerve not only by direct pressure but also by osteophytes extending into the nerve itself.

The fact that 13 of the cases showed no spur formation does not necessarily exclude arthritis of the joint but merely excludes arthritis of the hypertrophic type which might affect the adjacent structures by direct bony extension. Indeed Sashin in a series of 257 postmortem examinations found arthritic changes in all sacro-iliac joints in persons over the age of 60. Although hypertrophic changes were not found in 7 of the bodies over the age of 65 in the present investigation (table 2), this does not rule out degenerative changes in these joints.

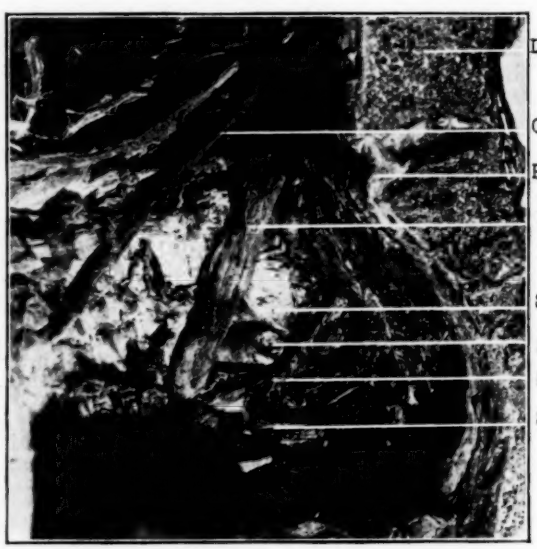

Fig. 3.—Lipping of sacro-iliac joint pushing lumbosacral trunk forward. All hypogastric vessels with the exception of the superior gluteal artery have been removed.

On the whole, those showing moderate involvement were not considered as apt to produce any considerable

effect on the trunk. Willis describes two types of osteogenic change in the sacro-iliac joint: (1) a smooth calcificatioin of the anterior sacro-iliac ligament and (2) an irregular lipping at the periphery of the joint. The minimal cases in the present study would fall in this first group, as we placed all joints with a small

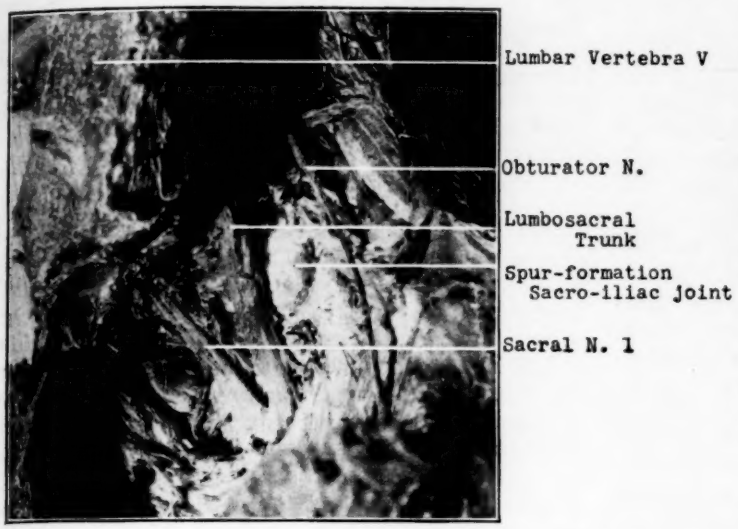

Fig. 4.—Hypertrophic spur formation involving only the middle one third of the sacro-iliac joint. The lumbosacral trunk lies medial to the spur and would be unaffected by it.

degree of smooth elevation of the anterior joint line in this classification. These cases could not conceivably produce sciatic pain by direct pressure on the nerve.

Casuccio in studying 65 patients with sacro-iliac joint disease found that 46 per cent had sciatica. He pointed out that the reason that this percentage is not higher is that the joint line is long and the diseased portion may not be in contact with the trunk. That well defined spurring of the joint may not encroach on the lumbosacral trunk at all is illustrated in figure 4, in which the

TABLE 1.—*Degree of Hypertrophic Arthritis of Sacro-Iliac Joints as Determined in Dissections of 64 Embalmed Bodies*

	Number	Per Cent
No lipping	13	20.3
Minimal	22	34.4
Moderate	13	20.3
Severe	16	25.0

TABLE 2.—*Age Distribution of Arthritic Changes in the Dissected Specimens*

Age	None	Minimal	Moderate	Severe	Total
25-45	3	4	3	1	11
45-65	2	11	5	8	26
65-94	7	5	4	7	23

hypertrophic change is limited to the middle one third of the joint and therefore lies lateral to the trunk. The lower one third of the joint must be involved in the arthritic process if the lumbosacral trunk is to be affected.

In the main, the hypertrophic changes were found to be more pronounced in the older age groups, as has been shown by Sashin and others. It is not by any means confined to persons of advanced age, however, as one of the specimens in this study showing very pronounced spur formation was that of a man of 35.

As only 10 of the specimens were from females, no significant comparison could be made as to sex distribution of this condition. Willis found sacro-iliac ankylosis to be 3 times as frequent in the male as in the female. Sashin concludes that in men the process starts earlier and proceeds faster and with greater intensity than in women. Willis found that the incidence of sacro-iliac ankylosis was twice as great in Negro as in white subjects.

This spur formation is demonstrable by x-ray, as is shown in figure 5, which is a roentgenogram of a dissected pelvis known to have a 3 plus lipping. In order to demonstrate the point on the joint over which the lumbosacral trunk passes, it is necessary to alter slightly the routine technic of pelvic roentgenography. It is necessary that the x-ray tube be placed at a so-called negative angle of approximately 20 degrees, i. e., with the tube at 20 degrees from the perpendicular and toward the head. The usual technic outlines the joint a short distance below the point in question.

CONCLUSIONS

1. The lumbosacral trunk was in direct contact with the sacro-iliac joint at the point at which it traverses the joint in its lower one third in all of the 64 specimens studied.

2. The upper portion of the origin of the pyriformis muscle was found to lie medial to the lumbosacral trunk in this study and never to lie between the trunk and the joint.

3. Hypertrophic arthritis in the form of severe spur formation on the anterior line of the sacro-iliac joint

Fig. 5.—X-ray appearance of dissected hemipelvis. Arrow points to spur formation in lower one third of the sacro-iliac joint at the exact point at which the lumbosacral trunk crosses the joint.

was found to be present in 25 per cent of the bodies that were studied. Most of these were considered capable of producing direct irritation of the lumbosacral trunk.

4. Hypertrophic sacro-iliac arthritis is more frequently found in the older age groups but is often encountered in younger persons.

5. Hypertrophic lipping of the joint in its lower one third where the lumbosacral trunk crosses it can readily be determined by anteroposterior roentgenograms of the pelvis.

THE TREATMENT OF EARLY SYPHILIS

BY THE CONCURRENT ADMINISTRATION OF ARSENIC AND BISMUTH IN A PERIOD OF FIVE DAYS

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The five day treatment of early syphilis warrants special consideration at this time, for it has certain undeniable advantages. It apparently "cures" a majority of patients, it affords rapid control of infectiousness, it gives no opportunity for lapse in treatment and there is a considerable saving to the patient in both time and expense. An effective "speed-up" method of treatment is desirable at this time, for it may be anticipated from statistics of past wars and the experience of England in the last year that there will be a sharp increase in syphilis. The question of the safety of the method has been the greatest drawback to its general adoption, for the incidence of cerebral reactions, some fatal, far exceeds the recorded incidence of similar reactions from standard treatment. Proponents of the five day method suggest, however, that the reports of fatalities from conventional treatment are not a true reflection of their actual incidence, and furthermore that the risk involved with the rapid method is far outweighed by the serious late complications of syphilis which result from inadequate standard treatment.

At the Cook County Hospital the five day method was instituted as a clinical experiment to corroborate the promising results of Chargin, Hyman and Leifer.[1] From August 1940 to January 1943, 481 cases were studied. The therapeutic results thus far have been encouraging. There were no fatalities in the group, although there were 3 instances of cerebral reactions.

In the beginning of the study mapharsen was the sole drug employed and it was administered by continuous intravenous drip. At the end of the first year our statistics indicated failures from one course of such treatment in approximately 12 to 15 per cent of the cases. In the hope of reducing this percentage of failures, the technic was then modified so that a bismuth compound was administered in addition to the mapharsen, daily intramuscular injections of soluble bismuth being employed in order to retain the "five day" feature of the treatment.

Though the interval is perhaps too short to permit a conclusive statement, it appears that the incidence of failures from one course of treatment has thereby been reduced from 15 per cent to approximately 4 per cent. The earlier failures, it was noted, occurred almost entirely in persons who had reported relatively late with eruptions of secondary syphilis. At first, therefore, bismuth was administered only to those with eruptions of secondary syphilis, but it was soon apparent that the bismuth was well tolerated, there being no increase in untoward symptoms. The concurrent use of arsenic and bismuth was then established as routine for all cases of early syphilis. It is of interest that Clausen, Longley and Tatum [2] later presented evidence from experiments with animals which indicated that the therapeutic effects from combining arsenic and bismuth were enhanced, "additive" to use Tatum's expression, and the combination caused no increase in toxic effects.

CLINICAL MATERIAL

The entire group numbered 481 patients, two thirds of whom were Negroes. There were 265 men and 216 women, 28 of them pregnant. With the exception of 12 cases of early syphilis, 1 congenital case and 1 of tertiary syphilis affecting the eye, every patient presented either a dark field positive chancre or an eruption of secondary syphilis. The oldest patient was a man of 48 and the youngest a girl of 14; the majority were in the early twenties.

TECHNIC

Before treatment the physical status of each patient was determined with the help of laboratory studies which included blood serologic tests, particularly the Kahn quantitative test, a complete blood count, urinalysis including tests for urobilinogen, icterus index, blood chemical determinations and a roentgenogram of the heart. The test for urobilinogen was found to be a most valuable procedure as an indication of the "course of events," and it became a rigid rule never to begin treatment until the morning specimen of urine had been tested for the presence of urobilinogen.

The daily dose of arsenic, regardless of age, weight or sex of the patient, was 0.24 Gm. of mapharsen dissolved in 2,000 cc. of 5 per cent dextrose solution. The supply for the entire day was made up in the morning and, with the solution maintained at room temperature, it was administered intravenously by the drip method for a period of about eight hours. A vein on the dorsum of the hand or one on the outer surface of the forearm near the wrist was selected in order to permit free motion of the elbow. The arms were alternated each day. The needles employed were the number 20 deep injection type, 1½ inches long. They were inserted up to the hub and then transfixed to the skin with adhesive tape. In addition, soluble bismuth sodium tartrate was injected intramuscularly into the buttocks in an amount equivalent to 22 mg. of bismuth each day for the five days.

The patients required no special preparations before treatment. On the first day solid food was withheld to alleviate nausea, but thereafter the patients received the ordinary ward diet. After completion of the day's treatment they were permitted to be up and about.

On the sixth day the blood was again examined serologically and also the spinal fluid. The patients were discharged from the hospital the following day and instructed to return at monthly intervals for examination, particularly for serologic studies by the quantitative method. The clinical application of the

From the Department of Dermatology, Cook County Hospital and Northwestern University Medical School. This study was sponsored by the Department of Public Health, State of Illinois.

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2. Clausen, N. M.; Longley, B. J., and Tatum, A. L.: The Quantitative Nature of the Coaction of Bismuth and Arsenical Compounds in the Therapy of Experimental Syphilis, J. Pharmacol. & Exper. Therap. **74**: 324 (March) 1942.

quantitative test is a relatively recent advance which has proved invaluable as a therapeutic index, for only by frequent observations of the progressive rise or fall of the serum titer of a patient's blood can one make an intelligent appraisal of his serologic status—whether serofast, improving or relapsing.

UNTOWARD SYMPTOMS AND REACTIONS

The reactions in general, though troublesome, were of a minor nature. The most common complications were fever, nausea and pain up to the arm, which were usually most annoying on the first day of treatment. The pain occurred in about 60 per cent of the patients, nausea and vomiting in 75 per cent and fever in 45 per cent. These symptoms usually appeared during the fourth hour of treatment and continued for one day only, but in a few instances they recurred on each of the five days. A secondary fever, on the sixth day, occurred in 30 per cent of the cases and lasted at most for a period of but three days. In addition, our statistics indicated the incidence of mild headache in 25 per cent of the cases, restlessness in 4 per cent, 3 cases of precordial oppression,[3] which was instantly relieved by the administration of atropine, transitory albuminuria in 5 per cent of the cases, cutaneous Herxheimer reaction in 4 per cent, 1 case of erythema multiforme on the second day, 1 of follicular purpura on the seventh day and several cases of morbilliform eruption, none of which necessitated interruption of treatment. Slight numbness and tingling of the hands and feet developed in 5 per cent of the cases in the second week after treatment and persisted for two or three weeks thereafter. It constituted a bothersome complaint in only 1 instance, that of a woman treated during the third month of pregnancy.

Serious reactions did occur, however, in 4 Negro men who had received treatment with mapharsen only.[4] In 2 of them there developed encephalopathy with transitory hemiparesis after treatment had been completed: on the sixth day in 1 case, on the ninth in the other. A third patient experienced a single convulsion after three days of treatment, and the fourth patient, on the completion of the first day of treatment during which he had received only 0.24 Gm. of mapharsen, suffered an overwhelming reaction with acute glomerulonephritis, anuria, uremia, hepatitis and pericarditis.[5] All 4 of these patients recovered with no apparent sequelae and in each case there was a serologic reversal of the blood.

Aside from these 4 cases with serious reactions, treatment had to be discontinued in 21 other instances because of the development of disturbing symptoms. Among them were 3 cases in which albuminuria developed apparently from a brand of bismuth that was soon discarded; 1 case of phlebitis; 8 cases of persistent fever of more than 101.4 F., and 9 cases in which treatment was suspended because of symptoms such as disorientation, drowsiness, crying spells, muscular aches, weakness and fainting. In all, treatment was discontinued in 6.5 per cent of the cases because of the development of various reactions. All these cases occurred early in the course of the study when caution and apprehension influenced the interpretation of symptoms. As the study developed the number of cases in which treatment had to be discontinued became considerably smaller. The incidence and severity of nausea and vomiting were decreased by withholding solid food on the first day, and the administration of 15 minims (1 cc.) of essence of peppermint every four hours afforded quick relief to many patients. The free use of sedation with a mixture of chloral hydrate 15 grains (1 Gm.) and sodium bromide 30 grains (2 Gm.) every four hours was also effective in the more bothersome cases, and it seemed too to lessen the severity of the arm pain. The most beneficial single measure, however, was the inflexible rule to "Discontinue therapy for the day on the development of any of the following: increasingly severe headache, pernicious nausea, repeated vomiting, undue restlessness, change in personality, temperature of 101.4 F. or any other unusual symptoms. Immediately administer 200 to 400 cc. of 25 per cent sucrose intravenously. If the symptoms persist, follow with 2,000 cc. of 10 per cent dextrose intravenously, this in turn to be followed by 2,000 cc. of isotonic dextrose and saline solution subcutaneously. If on the following day the symptoms have not completely disappeared, again administer 200 cc. of 25 per cent sucrose intravenously prior to the administration of mapharsen."[6] In cases in which treatment had to be interrupted temporarily, that day's unused mapharsen was then added to and distributed evenly over the course of the remaining days of treatment.

The immediate discontinuation of the therapy for the day on the development of such reactions and the free use of sucrose intravenously have undoubtedly been the most important factors in reducing the incidence of serious reactions, particularly the ominous cerebral reactions.

Exfoliative dermatitis, nitritoid reactions or blood dyscrasias did not occur in our series; nor was there a case of liver damage except for the one unusual case which properly should not be charged against the five day technic. And, most important, there were no fatalities.

RESULTS

Early Syphilis.—The series of cases studied totaled 481. Of this number 421 completed the full course of five day treatment, 310 of them with mapharsen alone and 111 with the combination of mapharsen and bismuth. Of the 60 patients who did not receive the full treatment 3 per cent were rejected after preliminary examinations on medical grounds, 6.5 per cent reacted unfavorably to the treatment and in the remainder treatment was withheld or suspended for nonmedical reasons and have no bearing on the study.

In the group of 310 cases which were treated with a single course of mapharsen alone, 200 were observed for a period of five months or longer. One hundred and forty-nine of them became seronegative and 23 were progressing satisfactorily as shown by steadily decreasing serologic titers. Nineteen of the 200 cases resulted in serologic relapse; in 3 others which were listed as cases with an unsatisfactory result there was a question as to whether they represented reinfections; there was also 1 case of serologic fastness, and in the

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4. Rattner, Herbert: The Five Day Treatment of Syphilis, Illinois M. J. **81**: 29 (Jan.) 1942.
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6. This "dehydration" technic was suggested by the resident physician, Lieut. Alfred B. Falk, M. C., A. U. S.

remaining 5 cases the results were still pending. In summarizing, to date, one course of five day treatment for early syphilis with arsenic alone gave results that were satisfactory in 86 per cent of the cases, failures in approximately 11.5 per cent, and the results were still pending in 2.5 per cent.

Of the group of 111 cases treated with one course of mapharsen and bismuth used concurrently, 35 were not evaluated because of a too brief period of observation. Of the remaining 76 cases, 50 became serologically negative, 21 showed progressive serologic improvement and there was 1 case of serologic relapse. The outcome in 4 others is still questionable and in the interest of conservatism they were listed as failures. Thus, to date, satisfactory results were obtained in 93.5 per cent of the cases and failures in 6.5 per cent of those who received one course of treatment with the combination of arsenic and bismuth. Further study of the questionable cases, we have reason to believe, will show this estimate to be too conservative.

Pregnancy.[6a]—Twenty-seven pregnant women received the treatment, 4 of them for primary syphilis, 15 for eruptions of secondary syphilis and 8 for latent syphilis of less than four years' duration. Ten received arsenic alone and 17 had the combined treatment. Twenty-six cases resulted in the birth of a full term, normal infant; 1 syphilitic infant was born of a mother who, after responding successfully to one course of treatment, acquired a second infection while the infant was still in utero. In addition, there were 5 women who had been treated for early syphilis by the five day method who subsequently became pregnant and, though no additional treatment was given, each has since given birth to a normal infant, in 1 case twenty months after completion of the five day treatment.

Retreated Cases.—Twenty-three patients were retreated because of relapse, reinfection or serofastness. In none of them was there an allergic reaction or any other complication due to the second course of treatment. Eight of this group attained seronegativity; 9 cases showed satisfactory serologic improvement; 3 were still pending, although the serologic titer was showing a progressive fall; 1 case was lost from observation. From the very beginning of the study difficulty was encountered in deciding whether certain cases were examples of relapse or reinfection. The practice at first was to classify them all as failures, a practice which Schoch has criticized as being unwarrantedly conservative. None of the cases fulfilled the established criteria for reinfection, yet in many of them certain factors weighed the scale of evidence in favor of reinfection. There was, for example, the instance of a woman who received the five day treatment for an eruption of secondary syphilis. No primary lesion was observed by us. She became serologically negative and gave repeated negative tests for a period of four months. She then disappeared from observation and four months later returned with a chancre on her lip. She insisted, and she was not unintelligent, that there previously had not been a sore on her lip and it was the opinion of the entire staff that, despite the lack of established criteria, this case represented one of reinfection.[6b] It was soon noted that several other cases presented similarly doubtful circumstances; and, finally after careful weighing of the facts in each instance, the label of reinfection was given to 15 cases. All of them, after attaining seronegativity, gave repeated seronegative tests for several months. Each of them then presented new clinical evidence of early syphilis and a history very strongly suggestive of a new infection. Furthermore, although we have no tangible evidence for it, we are inclined to agree with Schoch, who has stated that in patients who have received rapid treatment "reinfection can take place in the face of reagin still remaining from the first infection."[7]

Additional Notes.—The spinal fluid was examined in 420 cases. Slight abnormalities in the colloidal gold curve were noted in 10 cases, and in 12 cases there was an insignificant increase in the cell count. The spinal fluid was again examined one year after the attaining of blood seronegativity in 18 cases. All gave normal findings. The spinal fluid also of the 23 patients who had received the second course of treatment was reexamined. All were normal except 1, a young Negro woman treated for serologic relapse whose spinal fluid findings indicated a definite paretic curve six months after the first treatment.

Twenty-seven patients were treated in the seronegative chancre stage. Eight of these failed to return for observation. Of the remainder all but 1 remained seronegative, the longest observation being twenty-six months. In the 1 case which was lost from observation for five months the history strongly suggested a new infection. Incidentally, of the 151 cases dropped from the study because of insufficient observation 19 had been treated for seronegative primary syphilis and 23 others had already attained seronegativity.

The best results were obtained in patients who reported for treatment early in the course of the disease, for serologic relapses occurred in only 2 of the 135 patients who had been treated for chancre. In the successful cases seronegativity usually occurred in the tenth week after treatment. In 1 case, however, the blood test did not give a negative reaction until twenty-two months after treatment. Among the patients who suffered relapse were a husband and wife who were treated for early syphilis within three weeks of each other. Other patients had been treated successfully at the same time and with the same lot of drug, yet both husband and wife exhibited lesions of cutaneous relapse.

There were no cases in which there was an appreciable alteration of the blood chemical findings, the blood picture or the icteric index. In 6 patients in whom five day treatment was interrupted because of the onset of complicating symptoms, daily injections of mapharsen by the syringe method were later well tolerated.

COMMENT

The method, to judge from the results of the experiment at the Cook County Hospital, has much to recommend it but there are certain disadvantages that cannot be disregarded. Of most importance is the danger of serious cerebral reactions, 1 case of a single convulsion and 2 of encephalopathy in our group of 424 cases. Five of the patients who needed a second course of treatment refused it because of the nausea, headache and arm pain that they suffered the first time.

6a. Rattner, Herbert: The Treatment of Syphilis in Pregnancy by the Five Day Massive Dose Method, Am. J. Obst. & Gynec., to be published.

6b. "Established criteria" require among other things that the new lesion be at a "site other than that of the primary lesion of the first infection."

7. Schoch, A. G., and Alexander, L. J.: Reinfection in Syphilis: Newer Concept of Reinfection Encountered with Ten Day Arsenotherapy of Early Syphilis Controlled by Quantitative Serologic Tests, Am. J. Syph., Gonor. & Ven. Dis. **27**: 15 (Jan.) 1943.

The treatment can be adapted to routine measures, for the dosage is the same regardless of the age or weight of the patient, and even the treatment of the reactions may be standardized, for they are relatively few in kind. The essential laboratory aids are simple to perform. Relatively little active nursing care is required, because the patients are permitted to leave the bed at the conclusion of the day's treatment. It is important, however, that the nurses be acquainted with the procedure, and the patients should be under their constant observation for early signs of reactions.

With this procedure there is no lapse of treatment. This is most important, for the dangers of inadequate treatment have often been stressed. Indeed, Padget's [8] careful study of long-term results in early syphilis led him to conclude that, "if continuous treatment cannot be given, no treatment is the desideratum." And it is known that the vast majority of infected persons, because of sheer ennui, do not persist through the lengthy course of conventional continuous therapy.[9]

There is much to be said also for the fact that the patient can have the treatment completed in one week. This feature alone has aroused an enormous interest. The patient, shocked as he usually is to learn that he has the disease, is psychologically conditioned to give complete cooperation before his remorse wears away; and the feckless one's cooperation can usually be sustained for a period of one week, though rarely longer.

However appealing the five day feature, of greater significance are the statistics which indicate that satisfactory results were obtained to date in approximately 95 per cent of the cases.

SUMMARY

1. The five day treatment method was studied in 481 cases of syphilis. Of this number 421 completed the full course of five day treatment, 310 of them with mapharsen alone and 111 with a combination of mapharsen and bismuth used concurrently.

2. There were no fatalities in the group, but there were 3 instances of serious cerebral reactions and a high incidence of unimportant minor reactions. Treatment was discontinued in 6 per cent of the cases because of the developn.ent of complicating symptoms. Three per cent of the candidates were rejected as unsuited for the treatment because of physical defects.

3. The study emphasized the value of reliably performed quantitative serologic tests as a therapeutic index and focused attention on the questions of reinfection and superinfection. In the group studied there were at least 15 instances of reinfection.

4. The period of observation is too short to permit final conclusions, but the results to date indicate that the use of mapharsen alone produced satisfactory results from one course of treatment in 86 per cent of the cases, one course of the arsenic-bismuth combination produced satisfactory results in approximately 95 per cent of the cases, and a second course of treatment, administered usually six months after the first course, apparently "cured" practically all of those who failed the first time.

25 East Washington Street.

8. Padget, Paul: Long-Term Results in the Treatment of Early Syphilis, Am. J. Syph., Gonor. & Ven. Dis. **24**: 692 (Nov.) 1940.

9. Sadusk, J. F., Jr.; Craig, Branch, Jr.; Brookens, Norris; Poole, A. K., and Strauss, M. J.: Observations on the Massive Dose Arsenotherapy of Early Syphilis by the Intravenous Drip Method, Yale J. Biol. & Med. **14**: 333 (March) 1942.

THE USE OF PROSTIGMINE IN THE TREATMENT OF POLIOMYELITIS

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In recent years radical changes in the therapy of poliomyelitis have been advocated which have stimulated reinvestigation of the pathologic physiology of the disease. The Kenny concept has placed emphasis on neuromuscular changes which obviously cannot be explained by the well recognized lower motor neuron paralysis in this disease.[1] "Muscle spasm" and "incoordination" have been shown to be frequent and prominent symptoms of poliomyelitis.

"Muscle spasm" consists of at least two phenomena involving muscular hyperactivity in tonus and proprioceptive reflexes. The first phenomenon is a muscular rigidity or hypertonus which results in deformity (as in "foot retraction" or "foot drop") and limitation of passive motion (as in the rigidity of the back). The second type of change, which has been called "muscle spasm," is a limitation of passive motion which is at least in part the result of hyperirritable stretch reflexes in the muscles involved. As an example, in straight leg raising in subacute cases little or no resistance to passive motion is noted until a certain point is reached, when a decided resistance develops suddenly, associaciated with contraction and pain in the hamstring muscles. This appears to be a stretch reflex, the "trigger mechanism" of which is set at a lower level than normal. These changes in the muscles persist unchanged for months in many cases unless proper treatment is instituted early in the course of the disease.

Experimental studies on the mechanism of these phenomena have demonstrated that they have a neurogenic basis.[2] The muscular rigidity and hyperirritable stretch reflexes disappeared temporarily during spinal anesthesia in patients with poliomyelitis. On the other hand, intravenous pentothal anesthesia produced relatively little effect on the muscle spasm. These studies suggest that muscle spasm may be the result of changes produced in the gray matter of the spinal cord by the virus invasion. This view is corroborated by electromyographic recordings from hypertonic muscles in cases of poliomyelitis.[3]

An analysis of available sections of the spinal cord from 78 patients with poliomyelitis who died in the acute stage of the disease has revealed that inflammation about the internuncial neurons in the gray matter of the spinal cord occurred in almost every case and that injury to internuncial neurons appeared to be prominent in many cases.[4] On the other hand, little or no injury to anterior horn cells was observed in about 40 per cent

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1. Kenny, Elizabeth: The Treatment of Infantile Paralysis in the Acute Stage, Minneapolis, Bruce Publishing Company, 1941. Cole, W. H., and Knapp, M. E.: Kenny Treatment of Infantile Paralysis: Preliminary Report, J. A. M. A. **116**: 2577 (June 7) 1941.

2. Kabat, Herman, and Knapp, M. E.: The Mechanism of Muscle Spasm in Human Poliomyelitis, to be published.

3. Schwartz, R. P., and Bouman, H. D.: Muscle Spasm in the Acute Stage of Infantile Paralysis as Indicated by Recorded Action Current Potentials, J. A. M. A. **119**: 923 (July 18) 1942.

4. Kabat, Herman, and Grenell, R. G.: The Pathology of the Spinal Cord in Human Poliomyelitis, to be published.

of the cases, while the other 60 per cent showed more or less pronounced destruction of the large motor neurons. In 1 case which had shown decided muscle spasm, the internuncial injury was severe while the anterior horn cells appeared to be unaffected. It has also been demonstrated in experiments on dogs that a localized lesion of the internuncial neurons in the spinal cord produced hypertonus of skeletal muscles similar to that observed in clinical poliomyelitis.[5] The significance of the internuncial lesion becomes clear when one realizes that practically all impulses through reflex arcs as well as from higher centers, including the pyramidal tracts, must be relayed through the internuncial neurons to excite the large motor neurons in the anterior horn. In other words, an internuncial lesion should interfere with and disorganize synaptic transmission to the anterior horn cells. The muscular hypertonus and proprioceptive reflex hyperirritability could therefore be considered release phenomena resulting from removal of inhibition from anterior horn cells due to synaptic disorganization. "Incoordination" may also be explained, at least in part, by such synaptic disorganization resulting from injury to the internuncial neurons. The common occurrence of the internuncial lesion in poliomyelitis is further substantiated by the observation of Minckler[6] that synaptic terminals on the surface of the anterior horn cells were degenerated as a result of injury to internuncial neurons in 8 cases of poliomyelitis studied by special staining methods.

THE EFFECTS OF PROSTIGMINE ON MUSCLE FUNCTION IN POLIOMYELITIS[7]

It is now generally believed that the fundamental effect of physostigmine and prostigmine is to depress the function of an enzyme called cholinesterase.[8] This enzyme is responsible for the rapid splitting of acetylcholine, rendering this powerful substance physiologically inactive. By inhibiting cholinesterase, prostigmine allows acetylcholine to accumulate to a greater extent than normal at synapses, parasympathetic nerve endings and myoneural junctions and in the blood and in that way produces profound physiologic changes throughout the body.

In myasthenia gravis, prostigmine has a striking effect in relieving fatigue of skeletal muscles.[8] In postencephalitic Parkinson's disease, administration of prostigmine aggravates the muscular rigidity and tremor to a large extent.[9] Fibrillation of denervated muscle is increased by the drug.[10] Even in normal persons fascicular twitchings may be induced.[8] All these actions of prostigmine have been attributed to the inhibition of cholinesterase at the myoneural junction of skeletal muscle.

The effects of prostigmine on muscle function in poliomyelitis have been studied in a series of 24 patients ranging in age from 2 to 46 years. The time from the onset of paralysis varied from three weeks to seventeen months. In 20 patients the effects of prostigmine were observed within an hour after subcutaneous injection of 0.5 to 2.5 mg. of prostigmine methylsulfate. The effects of oral prostigmine bromide have also been observed in these patients.

Early in the course of this investigation it was noticed that effects on the function of skeletal muscle were more severe with larger doses of the drug, producing unpleasant parasympathetic symptoms. Atropine sulfate given simultaneously with the prostigmine was found to eliminate these unpleasant parasympathetic effects while not producing any apparent inhibition of the important effects on muscle function. This made it possible to give larger doses of prostigmine together with atropine, producing more pronounced muscular effects and no unpleasant symptoms whatever. This combination of prostigmine and atropine has been used routinely in treatment. This will be discussed in more detail later.

The most significant effect of prostigmine on patients with poliomyelitis was the relaxation of muscle spasm. The decrease in hypertonus was accompanied by a decrease in muscle pain. There was also evidence that prostigmine decreased "incoordination" and in some instances increased active muscular contraction.

The muscle spasm was measured quantitatively by recording the range of passive motion allowed by various muscle groups before and after injection of prostigmine. Measurements were made by means of a goniometer and the range of passive motion was recorded in angles. The error in measurement is about $\pm$ 2.5 degrees. The increase in range of passive motion observed within an hour following injection of prostigmine in poliomyelitis patients is shown in table 1. These data show that the range of passive motion is increased significantly by this drug. The patients reported that their motions felt "looser." In some cases deformities decreased or disappeared. The hypertonic muscles also felt more elastic and less rigid to the examiner, and tendons and muscles stood out less noticeably and were softer and less painful on palpation.

A striking fact was that the extent of relaxation varied greatly in different muscle groups in the same patient. In some patients one pectoral muscle relaxed noticeably while the corresponding muscle on the opposite side showed no change in spasm. In others, the soleus relaxed while there was no change in the overlying gastrocnemius muscle in the same leg. Many other examples may be cited of localization and specificity in the action of prostigmine, although the drug is presumably distributed equally throughout the body.

Several types of deformities have decreased or disappeared following administration of prostigmine. In several instances "foot drop" due to hypertonus in the posterior calf muscles has been improved or eliminated. In 2 instances flexion deformity of the hand greatly decreased within an hour after subcutaneous injection of the drug. In 3 an elevated shoulder resulting from hypertonus of the upper trapezius has come down to a more normal position following prostigmine. These observations are the more significant since these deformities had been present for at least four months.

The increase in active motion observed following prostigmine seemed in some cases to be related to the decrease in muscle spasm in the antagonists. Six months after the onset of poliomyelitis in 1 instance active motion appeared for the first time in finger extensors one hour after subcutaneous injection of prostigmine and was accompanied by decided relaxation of the flexor muscles. Another patient at five and one-half months after the onset was able to raise his head from the table in the supine position for the first

5. Kabat, Herman, and Grenell, R. G.: Muscle Hypertonus from Temporary Arrest of Circulation of the Spinal Cord, to be published.

6. Minckler, Jeff: Pathologic Alterations in Surface Relationships and Morphology at the Human Synapse, Am. J. Path. **18**: 1061 (Nov.) 1942.

7. Some of the prostigmine used in this investigation was supplied by Hoffmann-LaRoche, Inc.

8. Sollmann, Torald: A Manual of Pharmacology, ed. 6, Philadelphia, W. B. Saunders Company, 1942.

9. Milhorat, A. T.: Studies in Diseases of Muscle: IX. Effect of Quinine and Prostigmine Methyl Sulfate on Muscular Rigidity in Paralysis Agitans, Arch. Neurol. & Psychiat. **45**: 74 (Jan.) 1941.

10. Magladery, J. W., and Solandt, D. Y.: Relation of Fibrillation to Acetylcholine and Potassium Sensitivity in Denervated Skeletal Muscle, J. Neurophysiol. **5**: 357 (Sept.) 1942.

time two days after initiation of prostigmine therapy. Other examples of increased active motion in arms, legs and trunk will be mentioned later in the discussion of treatment.

As mentioned in the introduction, "incoordination" of muscles, resulting presumably from disorganization of synaptic connections in the spinal cord, is a frequent occurrence following poliomyelitis. In 1 case passive abduction of the arm resulted in jerky contractions of the biceps, wrist extensors and trapezius muscles. In some cases active or passive flexion of the thigh produced contractions in the adductors, sartorius or glutei. Hyperirritability of reflex arcs was so severe in 1 case that light tapping of the ribs produced a reflex twitch of both pectoral muscles, more severe on the ipsilateral side. In all types of "incoordination" in poliomyelitis patients, the abnormal muscle contractions in the superfluous muscles are frequently characterized by fascicular twitchings. "Incoordination" appeared to be definitely decreased in some patients by prostigmine.

Spontaneous fascicular twitchings following administration of prostigmine were observed in only 4 patients, all of whom were between 14 and 20 years of age. Fascicular twitchings from prostigmine were noted only in the face, upper part of the trunk and arms. In no instance were fascicular twitchings induced by prostigmine in a paralyzed muscle or a muscle in spasm even in cases in which motor denervation had produced well defined atrophy. The fascicular twitchings from prostigmine occurred one-half to one hour after administration of the drug, rarely persisted for more than an hour and were never followed by harmful after-effects.

The question arises as to the locus and mechanism of action of prostigmine in poliomyelitis. The fact that elimination of parasympathetic actions of the drug by atropine does not interfere with the effects on muscle function demonstrates conclusively that the muscular action is not secondary to general parasympathetic effects. The evidence also is clear that the changes in muscle function observed are not the result of the action of prostigmine on the myoneural junction in skeletal muscle. Accumulation of acetylcholine due to inhibition of cholinesterase at the myoneural junction could only increase hypertonus of skeletal muscle, while administration of prostigmine in poliomyelitis patients significantly decreased muscle spasm. The inhibition of hyperirritable stretch reflexes by prostigmine as well as the inhibition of "incoordination" cannot be the result of action of the drug at the myoneural junction. These data suggest that the beneficial action of prostigmine observed in poliomyelitis may be the result of its inhibitory action on cholinesterase affecting synaptic function in the spinal cord. According to Sollmann,[8] with increasing doses of physostigmine in animals the drug first affects the spinal cord and then the bulbar centers, and even with toxic doses consciousness is maintained until the end.

In order to demonstrate more conclusively the action of prostigmine on the spinal cord, the drug was injected intraspinally in 3 patients. The relaxation of muscular hypertonus was very much greater than had been observed following subcutaneous prostigmine. Furthermore, while the effect on muscle function was coincident with the parasympathetic actions following subcutaneous administration of the drug, the muscular relaxation appeared earlier than the parasympathetic effects following intraspinal prostigmine. The effects on muscle function preceded significant absorption of the drug into the general circulation. This rules out an effect on the myoneural junction of skeletal muscle as the factor responsible for the muscular relaxation and points to the spinal cord as the locus of action of the drug. Kremer [11] has recently demonstrated depression of deep reflexes and spasticity from intrathecal injection of prostigmine in man. The effect is a local one on spinal centers.

These studies suggest, therefore, that prostigmine has important effects on the spinal cord in man which appear to be of value in the therapy of a disease of the spinal cord, poliomyelitis. They also suggest that the spinal cord may be more sensitive to prostigmine than the myoneural junction, regardless of the route of administration. The depression of muscular hypertonus, stretch reflexes, "incoordination" and reflex hyperirritability after oral or subcutaneous administration of prostigmine seem to be the result of spinal action of the drug with no evident action on the myoneural junction. The increase in active motion observed following prostigmine may be due also to the action on the spinal cord rather than on the myoneural junction. Merlis and Lawson [12] have observed in dogs that, following intravenous or intraspinal physostigmine,

TABLE 1.—*Degrees Increase in Passive Motion in Poliomyelitis Produced by Subcutaneous Prostigmine in One Hour*

Patient	Age of Patient	Time Since Onset	Straight Leg Raising		Knee Flexion		Knee Flexion Prone		Dorsiflexion of Foot (Knee Straight)		Dorsiflexion of Foot (Knee Flexed)		Abduction of Leg, Both	Abduction of Arm		Abduction of Arm (Arm Externally Rotated)		Forward Flexion of Arm		External Rotation of Arm	
			Right	Left	Right	Left	Right	Left	Right	Left	Right	Left		Right	Left	Right	Left	Right	Left	Right	Left
C. G.	20	3 wk.	12	3	17	18	..	..	1	10	10	0	8	..	..	..	..	..	..	..	..
A. K.	7	3 wk.	10	20	10	10	..	..	4	10	5	5	50	..	..	..	..	..	..	..	..
V. B.	5½	1 mo.	13	10	..	..	..	..	0	10	7	0	8	..	..	..	..	..	..	..	..
W. T.	20	2½ mo.	17	10	6	4	40	36	10	7	5	2	14	0	25	0	5	7	0	..	..
M. G.	13	3 mo.	6	3	0	3	..	..	0	10	0	2	5	10	23	30	15	..	..	..	..
F. B.	30	3½ mo.	25	22	..	..	..	..	12	15	5	0	13	0	10	15	5	..	..	..	..
G. H.	25	5 mo.	13	15	15	17	..	..	10	0	11	0	10	17	8	20	10	..	..	..	..
E. P.	12	4 mo.	8	11	..	..	11	5	5	4	3	2	3	..	..	..	..	..	..	..	..
A. Z.	11	5 mo.	10	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
R. P.	18	4½ mo.	10	10	0	4	..	..	0	2	5	2	3	..	..	..	..	..	..	..	..
L. J.	44	5½ mo.	10	12	2	3	..	..	0	5	3	0	13	1	5	8	3	..	..	..	..
M. C.	46	5 mo.	..	..	..	..	..	..	..	..	..	..	..	14	9	..	..	25	21	23	15
R. L.	8	5½ mo.	21	17	..	..	25	26	5	6	8	10	15	..	..	..	..	..	..	..	..
L. W.	6	5½ mo.	4	10	..	..	..	..	0	2	0	0	7	..	..	..	..	..	..	..	..
B. C.	17	6 mo.	..	..	..	..	..	..	..	..	..	..	..	..	21	..	23	..	6	..	12
A. E.	36	6 mo.	16	11	17	5	15	45	0	0	0	0	10	10	14	..	..	2	2	..	..
F. K.	14	6 mo.	12	6	..	..	58	6	0	13	6	11	0	..	..	..	..	..	..	..	..
P. S.	16	16 mo.	18	0	..	..	0	0	3	1	3	6	5	..	..	..	..	..	..	..	..
M. P.	22	16 mo.	13	0	..	..	10	28	0	2	3	10	0	..	..	..	..	..	..	..	..
D. H.	17	17 mo.	17	13	3	7	..	..	4	4	0	0	4	..	..	22	2	12	5	..	..

11. Kremer, Michael: Action of Intrathecally Injected Prostigmine, Acetylcholine and Eserine on the Central Nervous System in Man, Quart. J. Exper. Physiol. **31**: 337 (July) 1942.

12. Merlis, J. K., and Lawson, H.: Effect of Eserine on Spinal Reflexes in the Dog, J. Neurophysiol. **2**: 566 (Nov.) 1939.

the flexion reflex was augmented while the knee jerk was depressed. They proved that these effects on reflexes resulted from the action of the drug on the spinal cord and that atropine failed to antagonize this spinal action.[12] Changes in reflexes were obtained with doses of physostigmine which did not affect the myoneural junction. The experimental evidence of these investigators also demonstrated that fascicular twitchings are due to the action of physostigmine on the spinal cord rather than on the myoneural junction. This view is supported by the observation previously mentioned that fascicular twitchings were never induced by prostigmine in paralyzed muscles in poliomyelitis patients, although denervated muscle is hypersensitive to acetylcholine.[10]

The mode of action of prostigmine on the spinal cord in man appears to be complex, the drug inhibiting some reflexes and augmenting others. In general, the proprioceptive functions such as muscle tonus and stretch reflexes appear to be inhibited by prostigmine in man, while active motion may be augmented. Merlis and Lawson[12] observed in dogs that physostigmine augmented reflexes from stimulation of the skin, such as the flexion reflex and the crossed extension reflex, while depressing the knee jerk (a modified stretch reflex, proprioceptive). They came to the conclusion that physostigmine acts on the synaptic connections to the anterior horn cells by influencing the function of the internuncial neurons. It will be recalled that evidence has been presented earlier that muscular hypertonus, hyperirritable stretch reflexes and "incoordination" in poliomyelitis may be related to a lesion of internuncial neurons. The beneficial action of prostigmine in poliomyelitis may therefore depend on localized action of the drug at exactly the site of abnormal function in the spinal cord. The fact that prostigmine relaxed spasm in some muscles and not in others in the same individual may perhaps be related to local differences in pathologic involvement of internuncial neurons and derangement of synaptic function in the spinal cord in poliomyelitis.

PROSTIGMINE AS AN ADJUNCT IN THE TREATMENT OF POLIOMYELITIS

Twenty patients suffering from poliomyelitis were given prostigmine subcutaneously, orally or by both routes as an adjunct in therapy. In almost all cases hot foments were continued throughout the period of prostigmine administration. Two of these patients were at the Gillette State Hospital for Crippled Children, St. Paul, 4 at the Elizabeth Kenny Institute, Minneapolis, 1 at St. Barnabas Hospital, Minneapolis, and 13 at the University of Minnesota Hospital, Minneapolis. Seventeen of the patients were in subacute stages of the disease, ranging from two to six months following the onset. There were 2 patients with acute poliomyelitis at three to four weeks after onset and 1 with chronic poliomyelitis at sixteen months after onset.[13]

The improvement following prostigmine was clearly demonstrable in many subacute cases despite the continuation of the other forms of therapy. The acute cases showed improvement immediately after initiation of prostigmine therapy that was apparently more rapid than the improvement usually noted in such cases with hot foments alone. However, this is difficult to evaluate since the patients were progressing satisfactorily with the hot foments. A large series of acute cases will be necessary to establish the value of prostigmine. The 1 case studied sixteen months after the onset showed definite improvement, but more such cases must be investigated before one can say that prostigmine is of value in the chronic stage.

The usual procedure was to begin by careful examination of the patient including measurements of limitation of passive motion in angles. The progress of the patient under prostigmine therapy could be evaluated quite accurately by repeated measurements of range of passive motion. The treatment was begun by studying the effects of hypodermic injection of prostigmine. The prognosis could be estimated roughly by the improvement resulting from a single subcutaneous injection. The doses used were as follows: for adults, 1.5 to 2 mg. of prostigmine methylsulfate together with $\frac{1}{100}$ grain (0.6 mg.) of atropine sulfate; for children of 8 to 13 years, 1 mg. of prostigmine with or without $\frac{1}{200}$ grain (0.3 mg.) of atropine, for children of 2 to 6 years, 0.5 mg. of prostigmine without atropine. With these doses the beneficial effects on muscle function were usually observed with no serious toxic symptoms. Subcutaneous injections were more effective than oral administration and were repeated when necessary in patients who did not respond rapidly.

Oral administration of prostigmine was begun in most cases after an initial injection of the drug, but in some cases oral doses alone were used. For adults the usual dose was gradually built up to prostigmine bromide 45 mg. and atropine sulfate $\frac{1}{100}$ grain (given simultaneously) three times a day. The children of 12 to 14 years received prostigmine bromide 30 mg. and atropine sulfate $\frac{1}{200}$ grain three times a day. Younger children were given prostigmine bromide 15 mg. two to five times a day without atropine. These doses usually did not cause toxic or unpleasant symptoms but the balance of prostigmine and atropine had to be adjusted carefully to the individual patient to avoid such symptoms. Patients have taken these doses for two months without unpleasant or harmful effects, and almost all patients showed some improvement in muscle function from the drug.

The increase in range of passive motion resulting from prostigmine therapy is summarized in table 2. It will be noted that the improvement varied from patient to patient and in different muscles of the same patient. It seems likely that these differences in response to prostigmine may be related to local differences in the severity of disorder of the spinal cord.

REPORT OF CASES

CASE 1.—F. B., a woman aged 30, was started on treatment one week after the onset of poliomyelitis. She had involvement of all four extremities at the onset and had difficulty in swallowing for three weeks. Three and one-half months after the onset she was unable to sit up and had pronounced weakness of both lower extremities, bilateral "foot retraction," limitation in range of passive straight leg raising and abduction of the lower extremities and stiffness of the back. There was considerable pain in the muscles on stretch or pressure. She was given two subcutaneous injections of prostigmine and atropine in one week and was then treated with oral prostigmine and atropine for two weeks, the medication being given in addition to hot foments. At the end of this time she was able to sit up easily, the foot retraction had disappeared, the back was much looser and passive abduction and straight leg raising were normal. She was able to stand and walk by

13. At our suggestion, 4 patients were treated with prostigmine at the Wesley Memorial Hospital in Chicago. The results have been made available through the courtesy of Dr. Compere and are included in table 2. Dr. Bennett has treated 40 subacute cases of poliomyelitis with prostigmine at our suggestion at Warm Springs, Ga., with encouraging results.

herself without support. Despite discontinuance of the drugs and the hot packs, the patient retained the considerable improvement. There appeared to be definite acceleration of recovery from administration of prostigmine.

CASE 2.—D. G., a boy aged 9 years, was started on treatment two weeks after the onset of poliomyelitis. At five months after the onset, weakness of the muscles of the right arm and shoulder and sharp limitation of passive abduction and forward flexion were present. The patient was given oral prostigmine in addition to hot foments for five weeks. After two weeks he showed a great increase in range of passive abduction and forward flexion and some increase in strength in the right arm. At the end of the period of treatment with the drug, the limitation of passive motion had practically disappeared and there was a considerable increase in active motion in the deltoid, pectoral and coracobrachialis muscles in the right arm. The improvement was retained after the prostigmine therapy had been discontinued. The improvement appeared to be accelerated by prostigmine.

CASE 3.—B. C., a girl aged 17 years, was started on treatment ten days after the onset of poliomyelitis. Six months after the onset the patient had paralysis of the left arm with sharp limitation of passive abduction, forward flexion and external rotation at the shoulder. There was considerable spasm in the left upper trapezius, in the wrist and finger flexors and in the triceps. The patient had a decided flexion deformity of the hand and the examiner was unable to straighten the fingers or extend the wrist. Considerable pain resulted from passive stretch of the hypertonic muscles. She was given one injection of prostigmine and atropine and then treated with oral doses of these drugs for two weeks, during which time the hot foments were continued. Within one hour after the injection the flexion deformity of the hand, which had been present for six months, completely disappeared. At the end of two weeks of therapy there was considerable improvement in passive abduction, forward flexion and external rotation at the shoulder. The triceps, trapezius, wrist and finger flexors were greatly relaxed. The most striking observation was the complete disappearance of the flexion deformity of the hand, which remains in normal alinement. In addition, the patient showed weak active flexion and extension of the forefinger, which she had been unable to perform previously. Ten days later another injection of prostigmine and atropine produced further significant improvement within a few hours. Recovery appeared to be more rapid as a result of the administration of prostigmine.

CASE 4.—M. C., a woman aged 46, was started on treatment five months after the onset of poliomyelitis. Five and one-half months after the onset the patient had considerable involvement of both arms. There was rigidity of the back and the back of the neck, elevation of the right shoulder, great limitation of passive abduction, forward flexion and external rotation bilaterally at the shoulders. There was spasm of the triceps and biceps and flexion deformity of the hands. While continuing with hot foments, the patient was given an injection of prostigmine and atropine, and then the drugs were administered orally for a period of three weeks. At the end of this time there was considerable improvement in abduction, forward flexion and external rotation. The shoulder elevation had decreased, the biceps was relaxed and the flexion deformity of the hands had practically disappeared. There was no change in the triceps and little improvement in the rigidity of the back. There appeared to be acceleration of recovery due to administration of the drug.

CASE 5.—R. L., a boy aged 8 years, was treated beginning three days after the onset of poliomyelitis. Five and one-half months after the onset he had paralysis of both lower extremities and was unable to sit up, to turn over in bed or to raise his head while lying in the supine position. He had no contraction of the abdominal muscles in attempting to sit up, could not support himself with his arms, either in the sitting position or in the prone position, and had decided weakness of the erectores spinae, rhomboid and teres major muscles. There was rigidity of the back with lumbar lordosis. There was considerable hypertonus in the hamstring, gastrocnemius, soleus and sartorius muscles. After an injection of prostigmine and atropine he was given oral prostigmine for three weeks. Along with drug administration he received hot foments for the first week only. For the following two weeks he was given the drug and manipulations, but the hot foments were discontinued because of boils. At the end of three weeks the patient was able to sit up by himself and turn easily in bed. He could easily raise himself with his arms in the prone position and could raise his head from the table in the supine position. There was considerable improvement in active motion in the erectores spinae, teres major and rhomboid muscles bilaterally. There was also great improvement in contraction of the abdominal muscles in attempting to sit up. The back was looser and the lumbar lordosis less severe. There was great relaxation of muscle spasm in all of the muscles involved except the sartorius, which showed little improvement. Very striking in this case was the first appearance of the ability voluntarily to raise his head from the table two days after the administration of prostigmine was started. The abdominal muscles contracted for the first time when he attempted to sit up one week after the medication was begun. Prostigmine appeared to accelerate recovery.

TABLE 2.—*Degrees Increase in Passive Motion Produced by Prostigmine Therapy Together with Hot Foments*

Patient	Age of Patient	Time Since Onset	Period of Prostigmine Therapy	Straight Leg Raising		Knee Flexion		Knee Flexion Prone		Dorsiflexion of Foot, Knee Straight		Dorsiflexion of Foot (Knee Flexed)		Abduction of Leg,	Abduction of Arm		Abduction of Arm (Arm Externally Rotated)		Forward Flexion of Arm		External Rotation of Arm	
				Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Both	Right	Left	Right	Left	Right	Left	Right	Left
A. K.	8	3 wk.	1 mo.	39	39	30	30	..	..	8	10	..	..	25	..	..	..	..	..	..	..	..
V. B.	5½	1 mo.	2 wk.	13	15	..	..	..	..	0	8	..	..	10	..	..	..	..	..	..	..	..
W. T.	20	2½ mo.	3 wk.	8	4	0	0	30	40	15	10	11	0	15	13	45	22	24	0	0	..	..
E. S.*	17	2½ mo.	2 wk.	..	..	25	80	..	..	10	25	..	..	..	..	..	..	..	..	..	..	..
M. G.	13	3 mo.	8 wk.	23	15	51	50	..	..	6	15	14	15	18	32	38	47	66	25	44	..	..
E. F.	12	3 mo.	6 wk.	9	9	40	30	..	..	14	15	6	..	19	20	25	44	55	..	..	..	..
F. B.	30	3½ mo.	3 wk.	50	55	..	..	..	..	22	26	15	17	33	..	..	..	..	..	..	..	..
R. P.	18	4½ mo.	1 mo.	21	23	12	13	..	..	..	..	..	..	22	..	..	..	..	..	..	..	..
O. M.	30	4½ mo.	2 wk.	9	19	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..
T. G.	2	4½ mo.	1 mo.	..	..	..	..	..	..	15	..	10	..	..	..	..	..	..	..	..	..	..
G. H.	25	5 mo.	8 wk.	18	21	16	0	35	0	18	16	21	12	18	28	5	43	24	25	35	..	..
M. C.	46	5 mo.	3 wk.	..	..	..	..	..	..	..	..	..	..	..	19	28	27	19	30	22	19	26
D. G.	9	5 mo.	5 wk.	..	..	..	..	..	..	..	..	..	..	..	20	..	80	..	50	..	..	..
A. Z.	11	5 mo.	3 wk.	11	15	..	..	..	..	..	..	..	..	7	..	..	..	..	..	..	..	..
P. V.*	11	5½ mo.	2 wk.	25	10	20	5	35	30	..	..	..	..	20	5	35	..	..	..	..	..	..
S. R.*	6	5½ mo.	2 wk.	..	..	..	..	..	..	..	25	..	..	..	..	..	..	..	..	..	..	..
L. J.	44	5½ mo.	4 wk.	20	26	27	31	..	..	..	..	..	..	17	11	30	7	32	10	12	..	..
R. L.	8	5½ mo.	3 wk.	40	28	..	..	0	0	11	9	16	19	10	..	..	..	..	..	..	..	..
R. C.*	22	6 mo.	2 wk.	20	25	0	25	..	..	10	5	..	..	..	20	15	..	..	20	0	..	..
C. W.	9	6 mo.	6 wk.	..	..	..	..	..	..	..	..	..	..	..	..	38	..	75	..	48	..	..
F. K.	14	6 mo.	3 wk.	20	19	..	..	..	..	2	9	0	0	11	..	..	..	..	..	..	..	..
B. C.	17	6 mo.	3 wk.	..	..	..	..	..	..	..	..	..	..	..	..	46	..	66	..	19	..	24
A. E.	36	6 mo.	3 wk.	0	0	0	0	0	0	0	0	0	0	0	0	0	..	..	5	2	..	..
M. F.	22	16 mo.	1 wk.	5	5	..	..	20	18	0	6	5	10	..	..	..	..	..	..	..	..	..

* These patients were treated at our suggestion at the Wesley Memorial Hospital, Chicago, and the data have been made available through the courtesy of Dr. E. L. Compere.

CASE 6.—W. T., a man aged 20, was started on treatment one month after the onset of poliomyelitis. Two and one-half months after the onset there was paralysis of both lower extremities and great weakness of the upper extremities. There was great rigidity of the back and limitation of passive motion resulting from spasm in the hamstrings, gastrocnemii, adductors, rectus femoris and quadriceps in the lower extremities and in the pectoralis, latissimus dorsi and trapezius muscles in the upper extremities. After one injection of prostigmine and atropine he was given these drugs by mouth for three weeks along with hot foments. At the end of this time the patient noted increased power in the upper extremities and improvement in turning over in bed and in sitting up. There was decreased spasm in the gastrocnemius, adductors and rectus femoris, while the hamstrings relaxed only slightly and there was no improvement in the quadriceps. There was considerable improvement in passive abduction but no change in forward flexion at the shoulder and little improvement in the back. The drug appeared to speed up recovery in this case.

CASE 7.—A. M. K., a girl aged 8 years, was started on treatment two weeks after the onset of poliomyelitis. At the time of admission she was walking with support. There was weakness in the lower extremities, although all muscles could contract except the toe extensors on the left. Three weeks after the onset there was spasm in the hamstrings, adductors, quadriceps, posterior calf muscles and the back. She was given several injections of prostigmine and oral prostigmine over a period of one month during which time hot foments were continued. There was rapid relaxation of the muscular hypertonus. The impression was obtained that the release of muscle spasm was more rapid than had been observed with hot foments alone. The day after adequate oral dosage of prostigmine was instituted the range of passive straight leg raising suddenly increased 15 degrees and 20 degrees on the two sides.

CASE 8.—R. P., a youth aged 18, was started on treatment one month after the onset of poliomyelitis. On examination four and one-half months after the onset the patient had decided limitation of passive motion in the hamstrings, quadriceps and adductors as well as rigidity of the back. He was given one injection of prostigmine and then oral prostigmine for one month, during which time the hot foments were continued. There was considerable improvement in the muscular hypertonus, although the progress in this case was not too encouraging.

CASE 9.—V. M. B., a girl aged 5½ years, was started on treatment two weeks after the onset of poliomyelitis. At five weeks after the onset there was limitation of passive motion due to spasm in the hamstrings, adductors and posterior calf muscles and the back. The patient was given one injection of prostigmine and then the drug was administered orally for two weeks along with hot foments. The prostigmine may perhaps have increased the rate of relaxation of spasm in this acute case.

CASE 10.—C. W., a boy aged 9 years, was started on treatment one week after the onset of poliomyelitis. When examined six months after the onset he had paralysis and atrophy of the left upper extremity. There was decided limitation of passive abduction and forward flexion at the left shoulder. He was treated with oral prostigmine for six weeks along with hot foments, resulting in considerable improvement in the range of passive abduction and forward flexion, with little improvement in active motion. Relaxation of muscle spasm appeared to be accelerated by prostigmine.

CASE 11.—A. Z., a boy aged 11 years, was started on treatment two days after the onset of poliomyelitis. At five months after the onset there was little residual paralysis except in the abdominal muscles. However, limitation of passive motion was still present in the hamstrings, adductors and back. In attempting to touch the toes with the knees straight, the patient could only reach to within 6 inches of his toes. He was unable to sit up straight with the knees straight because of the limitation imposed by his hamstring muscles. After an injection of prostigmine the drug was given orally for one week, during which time the hot foments were discontinued because of boils. After only one week of treatment with this drug, he could sit up straight with the knees straight and was able to touch his toes easily without bending his knees. There was considerable improvement in range of passive motion of straight leg raising and abduction, and there was a greater arch in flexion of the back. The drug therapy appeared to accelerate recovery.

CASE 12.—M. F., a woman aged 22, had a residual paralysis of the left leg and weakness of the right leg sixteen months after the onset. Because there was residual limitation of passive motion due to contraction of the hamstrings, posterior calf muscles and rectus femoris, the patient was given prostigmine. In attempting to touch the toes while standing with the knees straight, the fingers were 8 inches from the floor. One hour after an injection of prostigmine and atropine, the patient, for the first time in sixteen months, was able to touch the floor with the knuckles of the proximal phalanges owing to relaxation of the hamstring muscles. Oral prostigmine and atropine were given for one week along with hot foments. At the end of this time there was improvement in the range of passive motion because of relaxation of the hamstrings, posterior calf muscles and rectus femoris.

This case demonstrates that prostigmine may be effective in the chronic stage of the disease in some patients. In one other patient at sixteen months after the onset one injection of prostigmine caused relaxation in the hamstrings of one leg, but none of the other contracted muscles relaxed at all. In another patient at one and one-half years after the onset there was considerable relaxation of the hamstring and the shoulder muscles within an hour after injection of prostigmine and atropine. This leads one to hope that at least some of the more chronic cases may respond to this treatment.

CASE 13.—M. G., a girl aged 13, was started on treatment two weeks after the onset of poliomyelitis. She had paralysis of the entire body, widespread severe spasm and severe pain and tenderness at the onset. Three months after the onset the patient had well defined weakness and paralysis of the muscles of all four limbs, severe rigidity of the back and spasm of the hamstrings, quadriceps, posterior calf muscles and adductors in the lower extremities and in the pectoral and latissimus dorsi muscles in the upper extremities. She was unable to sit up, roll over in bed or use her arms effectively. Beginning three months after the onset she was given oral prostigmine and atropine for five weeks along with hot foments. Then she was given oral prostigmine and atropine and a subcutaneous injection of these drugs every evening for another week and oral medication alone for an additional two week period. At the end of this time the patient could sit up and turn over with ease. She could use her arms much better although they were still weak. There was great relaxation of spasm in the hamstrings, quadriceps, posterior calf muscles and adductors. The rigidity of the back was much improved, as was the spasm in the shoulder muscles. The drug appeared to accelerate recovery.

CASE 14.—F. K., a boy aged 14, was started on treatment one day after onset of paralysis. On admission he had complete paralysis of both lower extremities. Six months after the onset he had severe atrophy and paralysis in the muscles of the lower extremities. He had moderate spasm in the hamstring, gastrocnemius and adductor muscles and rigidity of the back. He was unable to sit up straight with the knees straight. Beginning six months after the onset he was given oral prostigmine and atropine for three weeks along with hot foments with some improvement. The drugs were discontinued for ten days and then he was given daily injections of prostigmine and atropine for one week. At the end of this time there was decreased spasm in the hamstring, gastrocnemius and adductor muscles and slight improvement of the back. He was able to sit up straight with the right knee straight and with the left knee slightly flexed. There was no improvement in active motion. The drug therapy apparently speeded up recovery.

CASE 15.—L. J., a man aged 44, was admitted to the hospital one day after onset of paralysis. On the way to the hospital the ambulance collided with a street car and he suffered a head injury. Proper treatment could not be carried out effectively for one month after the onset because of delirium. Five and one-half months after the onset the patient had paralysis and atrophy of the muscles in the lower extremities and decided weakness and some atrophy in the right arm. There was severe spasm in the back, the hamstring, quadriceps and adductor muscles in the lower extremities and in the shoulder muscles, particularly on the right side. The right shoulder was elevated by upper trapezius hypertonus and there was severe spasm in the pectoral and latissimus dorsi muscles. Six months after the onset, after two injections of prostigmine and atropine in the course of one week, oral administration of the drugs was begun and continued for three weeks. At the end of this period the patient was given an intraspinal injection of prostigmine. The medication was given along with hot foments. At the end of the period of drug therapy there was considerable relaxation of the spasm in the hamstrings, quadriceps, adductors in the lower extremities and in the right shoulder muscles as well as a moderate decrease in rigidity in the upper part of the back. The patient was able to hold his knees drawn up in bed, while formerly they had to be supported with pillows. There was increased active motion and strength in the right arm. There appeared to be some acceleration of recovery as a result of prostigmine administration.

CASE 16.—E. F., a boy aged 12, was started on treatment one month after the onset of poliomyelitis. Three and one-half months after the onset he was unable to sit up and had decided weakness of the lower extremities. He had severe spasm of the hamstring, gastrocnemius, adductor and back muscles and slight residual spasm in the shoulder muscles. There was still considerable pain on stretching the muscles. Three and one-half months after the onset, treatment with oral prostigmine and atropine was begun along with hot foments. After ten days the treatment was discontinued temporarily because the patient had an upper respiratory infection. After two weeks oral prostigmine was resumed with occasional injections of prostigmine and atropine. At the end of the period of drug therapy the patient was able to sit up and had improved active motion in both upper and lower extremities. There was considerable improvement in the rigidity of the back and in the spasm of the hamstring, gastrocnemius and adductor muscles in the lower extremities, while the hypertonus had disappeared from the upper extremities. The recovery appeared to be accelerated by drug therapy.

CASE 17.—O. M., a man aged 30, was started on treatment one month after the onset of paralysis. Four and one-half months after the onset, the patient had moderate paresis of the lower extremities, especially the right. There was still moderate rigidity of the back and spasm of the hamstring and adductor muscles, so that the patient was unable to sit up straight with the knees straight. He was given oral prostigmine and atropine along with hot foments for two weeks. At the end of this time he could sit up straight with the knees straight. There was much improvement in the rigidity of the back and in the spasm of the hamstring and adductor muscles. There was no significant change in active motion. The patient appeared to benefit from prostigmine therapy.

CASE 18.—G. H., a woman aged 25, was started on treatment six weeks after the onset of paralysis. She had severe involvement of all four extremities at the onset, more pronounced in the left arm and leg. Five months after the onset she had weakness of the upper extremities and paralysis of the lower extremities. She was unable to sit up, support her body on her elbow in bed or roll over. There was very pronounced rigidity of the back and severe spasm in the hamstring, gastrocnemius, soleus, quadriceps and adductor muscles in the lower extremities and in the shoulder muscles, particularly on the left. Five months after the onset, prostigmine and atropine therapy was begun and continued along with hot foments for eight weeks. At the end of this time there was considerable improvement in active motion in the upper extremities with almost complete disappearance of the hypertonus in the shoulders. One week after drug therapy was begun, the patient noticed that she could lift her trunk on her elbow and could support her weight, which she had tried to do many times before and had never succeeded in accomplishing. There was great improvement in the spasm in the hamstring, quadriceps, gastrocnemius, soleus and adductor muscles and some improvement in rigidity of the back. The drug therapy appeared to accelerate recovery.

CASE 19.—A. E., a man aged 36, had a very severe involvement of the entire body and was only able to move his head, fingers and toes weakly. While he had been admitted to another hospital one day after the onset, his treatment was inadequate. When first seen six months after the onset he had paralysis of all four extremities and was able to move only his fingers and toes. He had an extreme degree of rigidity in the back, severe spasm in the hamstring and quadriceps muscles in the lower extremities and pectoral, latissimus dorsi, triceps and pronator muscles in the upper extremities. He was given oral prostigmine and atropine as well as frequent injections of these drugs for three weeks, along with hot foments. He showed practically no improvement either in active motion or in relaxation of muscle spasm. There was temporary relaxation after injection of prostigmine and atropine, but the improvement was not retained.

CASE 20.—T. G., a boy aged 2 years, began treatment five weeks after the onset of poliomyelitis. Four and one-half months after the onset the patient had paralysis of the muscles of the left leg and weakness of the left soleus and quadriceps muscles. There was also a foot drop on the left with pes cavus due to hypertonus in the plantaris and soleus muscles. Oral prostigmine was given along with hot foments for two weeks and then repeated injections of prostigmine were given for another ten days. There was no improvement in active motion and relatively slight relaxation of the hypertonus.

It is difficult to evaluate the improvement resulting from therapy in poliomyelitis. The disease is variable in the distribution and severity of involvement as well as in its course. Therefore it is often a problem to predict accurately the rapidity of recovery that would have ensued had treatment not been given. An additional variable was introduced in this investigation by the fact that hot foments were continued during the period of prostigmine therapy. In several cases rapid progress was seen with prostigmine, although the hot foments were discontinued during this period. The rapidity of improvement with prostigmine therapy in some cases suggests definite therapeutic benefit from the drug. In other cases one could not be certain that the improvement was due to the drug; 2 patients with severe involvement showed little recovery.

SUMMARY AND CONCLUSIONS

1. Prostigmine decreases skeletal muscle hypertonus and proprioceptive reflex hyperirritability ("muscle spasm") in patients with poliomyelitis. It also reduces "incoordination." These effects may be evident one hour after subcutaneous administration of the drug. These actions of prostigmine apparently depend on alteration of function of synapses in the spinal cord and are not antagonized by atropine.

2. Prostigmine has been given a preliminary trial as an adjunct in the treatment of poliomyelitis. The approach to therapy has been based on the Kenny concept of the disease. In a series of 20 patients, most of whom were in the subacute stage of the disease, the results have been encouraging. The drug significantly increased the range of passive motion, decreased or eliminated deformities in some instances by relaxation of hypertonus and in some cases improved active motion. In a number of instances muscle spasm has shown more rapid improvement when prostigmine was added to the Kenny routine. In a majority of cases the drug appeared to accelerate recovery.

THE RELIABILITY OF CHEMICAL TESTS FOR ALCOHOLIC INTOXICATION

THE IMPORTANCE OF THE SELECTION OF PROPER MATERIAL FOR ANALYSIS

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The successful prosecution of violators of the drunken driver laws is dependent on an accurate medical diagnosis and the proper presentation of the evidence in court. Many physicians have found by painful experience that the usual symptoms of alcoholic intoxication do not necessarily establish this diagnosis. It is essential not only to examine the suspect thoroughly but also to demonstrate the presence of enough alcohol in the body tissues to produce these symptoms, for it may be necessary to prove beyond a reasonable doubt that the impairment of the ability of the driver to operate a motor vehicle was the result of the effects of alcohol and was not due to other drugs or to such conditions as fatigue, injury or disease.

The reliability of chemical tests for intoxication has been the subject of much dispute, but the results of our studies indicate that there is a definite correlation between the degree of intoxication determined clinically and the alcohol content of properly selected body fluids. The severity of the symptoms of alcoholic intoxication in human beings under the usually encountered conditions has proved to be practically proportional to the venous blood alcohol concentration within the limits of normal biologic variation. A study of the literature on this subject, the results obtained in a series of experiments and our experience with drunken drivers have convinced us that the chemical analysis of venous blood for alcohol is the most valuable aid in the diagnosis of intoxication because it can furnish definite objective evidence of intoxication and, of equal importance, evidence of sobriety.

Since June 1938 the Kingston Police Department has routinely used chemical tests of blood and urine in all of its drinking driver cases. The suspects were given a thorough clinical examination by the police surgeon (C. B. VanG.) and specimens of both urine and venous blood were obtained whenever possible. The specimens were examined (L. D. E.) by the methods of Heise,[1] and in cases which might come to trial in the courts the results were checked by another reliable method.[2] In our study of 101 cases we were voluntarily given permission to obtain 79 specimens of urine and 98 specimens of blood, while in 76 of these cases specimens of both blood and urine were secured.

The results of this procedure have been very satisfactory from the medical standpoint because in every case in which the examining physician made a diagnosis of intoxication he was confident that the person was not being unjustly accused. The physician believed several persons to be sober, and these opinions were confirmed by the finding of little or no alcohol in the specimens examined. The blood alcohol level has indicated the degree of intoxication in all but a few cases, and furthermore the physician has learned how to predict the blood alcohol concentration with a high degree of accuracy. The medicolegal value of this routine is demonstrated by the fact that 70 per cent of those accused of driving while intoxicated entered pleas of guilty. Several persons who stoutly maintained their innocence pleaded guilty on being told that the concentration of alcohol in the blood indicated that they were intoxicated. The number of convictions in court, however, has been disappointing. Only 1 of the 8 drivers tried in the city court has been convicted, although the 2 drivers tried in the county court were found guilty.

CORRELATION OF ALCOHOL CONCENTRATION AND SYMPTOMS

The use of chemical tests for intoxication depends on a proportionality between the severity of the symptoms and the concentration of alcohol in the material tested. The existence of this proportionality has been the subject of much controversy and discussion.

The American Medical Association's Committee to Study Problems of Motor Vehicle Accidents[3] has reported that "the concentration of alcohol in the blood is one of the best criteria of intoxication because blood alcohol concentrations closely parallel detrimental effects noted in carefully conducted experimental tests. Although this relationship is not mathematically exact because of slight variations resulting from inherent differences in human beings, it is sufficiently accurate for practical purposes." The committee concluded that a blood alcohol concentration of greater than 0.15 per cent is conclusive evidence of intoxication and that levels of from 0.05 per cent to 0.15 per cent are often associated with mild intoxication. It was recommended that drivers having blood alcohol concentrations of less than 0.05 per cent should not be prosecuted. The National Safety Council's Committee on Tests for Intoxication[4] has come to similar conclusions, and practically identical interpretations have been incorporated into the laws of several states.

Mozes and Katonak[5] go so far as to state that, "as far, at least, as the operation of a motor vehicle is concerned, the alcohol concentration of various body fluids and expired air furnishes a far more reliable index of the degree of alcohol influence than the most careful and detailed clinical study." There are investigators, however, who believe that there is only a very general correlation with distinct exceptions in individual cases,[6] while still others are convinced that there is little, if any, correlation between alcoholic concentrations of body fluids and the symptoms.[7]

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This wide divergence of opinion might be explained by the observations of Mellanby and others [8] that the symptoms are more severe at a particular blood alcohol level when the concentration is increasing than when it is decreasing. To our knowledge this effect has not been demonstrated by work in which there has been a critical selection of specimens for analysis and when human subjects were drinking alcoholic beverages in repeated small amounts in the usual manner. It is more probable that this disagreement is largely the result of the following:

1. Many of the investigations reported have consisted of experiments on laboratory animals only. Obviously, conclusions drawn from such experiments are not necessarily applicable to man.
2. Some of the results reported after experiments on human beings may not be applicable to the usual intoxicated driver because these results were obtained under severe and unusual conditions by having the fasting subjects ingest large amounts of alcohol in a short period of time. These conditions are not encountered in the customary use of alcohol.
3. The criteria used for judging intoxication have undoubtedly varied from one investigator to another.
4. The alcoholic content of the various body fluids and tissues and of the breath are not comparable under all conditions. The disregard of this fact is undoubtedly responsible for many of the discrepancies found in the literature.

CHOICE OF MATERIAL FOR ANALYSIS

Since alcoholic intoxication is usually manifested by a wide variety of mental disturbances and neuromuscular incoordinations, it is reasonable to assume that if there is any proportionality between the degree of intoxication and the alcohol content of any tissue such a relationship would involve the central nervous system. The existence of such a relationship in both dogs and human beings has been demonstrated by Gettler,[9] who found that when the alcohol content of the brain reached a level of approximately 0.25 per cent there was a resulting gross lack of neuromuscular coordination which was manifested by a staggering gait. Slight symptoms appeared at a concentration of approximately 0.10 per cent and became more noticeable as the concentration of alcohol increased.

Obviously the alcohol content of the brain of a living individual cannot be determined directly, and for this reason various other body fluids and excretions have been analyzed on the assumption that their alcohol contents reflect that of the brain. Most American investigators have hesitated to obtain specimens of blood in medicolegal cases and have therefore calculated the blood alcohol concentration from the results of the analysis of urine or of expired air. The committee of the American Medical Association [3] states that the relationship between the concentrations of alcohol in the blood, urine, saliva and breath are sufficiently definite so that chemical tests of any one of these materials can furnish a "reliable measure of the degree of alcoholic influence." The existence of such relationships under all conditions, however, is questionable. In the light of the very definite critical levels of blood alcohol concentration now widely used for the interpretation of the results of the chemical analysis for alcohol, the relative errors involved in the use of urine, breath and blood are of great importance.

Urine.—A number of investigators have determined the ratio of the alcohol concentration of the urine to that of the blood by experimental methods. Some of the early workers [10] reported that the alcohol concentrations of urine and blood are practically identical. Miles,[11] using very low blood alcohol concentrations, concluded that the urine-venous blood alcohol ratio is near unity in the first half hour after the ingestion of alcohol but that then "for an hour or more" it is 1.35 to 1.50. He obtained individual ratios of from less than 1:1 to more than 2:1. Southgate and Carter,[12] using blood alcohol concentrations of from approximately 0.10 to 0.20 Gm. per hundred cubic centimeters, determined this ratio at one, two and one-half and six and one-half hours after the ingestion of alcohol. They stated that "when alcohol is drunk on an empty stomach the ratio of these concentrations of alcohol after one hour is a fairly constant figure of the order of 1.35." In a series of experiments in which the subjects had also ingested food, the average value for this ratio after two and one-half and six and one-half hours was 1.40:1, with a range of 1.25 to 1.67. They concluded that the concentration of alcohol in the urine is proportional to that of the blood "under all conditions so far examined." This average value of approximately 1.35:1 has been widely quoted as being that of the usual urine-blood ratio,[13] and the National Safety Council advises the use of this ratio in the interpretation of the urine alcohol concentration.

Similar, although slightly lower, average ratios have been obtained by the examination of intoxicated drivers and alcoholic hospital patients when the specimens were obtained at varying unknown intervals after the social use of alcohol. Bavis [14] reported an average ratio of 1.17:1. We have calculated from his data that the range of values was 0.81 to 1.65. Jetter [15] obtained an average urine-venous blood ratio of 1.23:1 with a range of 1.0 to 2.3. Mozes and Katonak [5] reported an average urine-blood ratio of 1.16:1. Their data indicate a range of values of 0.63 to 1.77. Stratton [16] has reported the following very definite relationship between the urine alcohol content and that of the brain: The percentage of alcohol in the brain equals 0.84 times the percentage in the urine minus 0.04 per cent of alcohol.

We have obtained a similar average urine-venous blood alcohol ratio of 1.26:1 in a series of 76 drinking drivers. The range of values was 0.69 to 1.71. Chart 1 demonstrates the degree of correlation between the blood and urine alcohol concentrations that may be expected in drinking driver cases.

Although all the reported average ratios are of the same order of magnitude as the average value obtained by Southgate and Carter under strictly controlled conditions, it is evident that this ratio may vary widely from the average in the individual case. For this reason any blood alcohol level calculated from the

8. Mellanby, Edward: Alcohol: Its Absorption Into and Disappearance From the Blood Under Different Conditions, British Medical Research Committee, Special Report Series 31, 1919, p. 1. Mirsky, Piker, Rosenbaum and Lederer.[9]
9. Gettler, A. O., and Tiber, A.: The Alcoholic Content of the Human Brain, Arch. Path. & Lab. Med. **3**: 218-226 (Feb.) 1927. Gettler, A. O., and Freireich, A. W.: The Nature of Alcohol Tolerance, Am. J. Surg. **27**: 328-333 (Feb.) 1935.
10. Chabanier, H., and Ibarra-Loring, E.: Du mode d'excretion par le rein des alcools éthylique et méthylique, Compt. rend. Soc. de biol. **79**: 8, 1916. Bogen, Emil: Drunkenness: A Quantitative Study of Acute Alcoholic Intoxication, J. A. M. A. **89**: 1505-1510 (Oct. 29) 1927.
11. Miles, W. R.: The Comparative Concentrations of Alcohol in Human Blood and Urine at Intervals After Ingestion, J. Pharmacol. & Exper. Therap. **20**: 265 (Nov.) 1922.
12. Southgate, H. W., and Carter, G.: The Excretion of Alcohol in the Urine as Guide to Alcoholic Intoxication, Brit. M. J. **1**: 463 (March 13) 1926.
13. Bavis, D. F., and Arnholt, M. F.: Tests of Blood and Urine of Drunken Drivers, Nebraska M. J. **24**: 220-222 (June) 1939. The 1938 Report of the Committee on Tests for Intoxication.
14. Bavis, D. F.: One Hundred and Forty-Five Drunken Drivers—A Blood and Urine Study, J. Lab. & Clin. Med. **25**: 823-827 (May) 1940.
15. Jetter, W. W.: Studies in Alcohol: I. The Diagnosis of Acute Alcoholic Intoxication by a Correlation of Clinical and Chemical Findings, Am. J. M. Sc. **196**: 475-487 (Oct.) 1938.
16. Stratton, Frank: Carbon Monoxide, Chlorides in Drowning, Alcoholism, Am. J. M. Jurisp. **2**: 21-24 (Jan.) 1939.

concentration of alcohol in the urine may vary greatly from the true value. This fact was pointed out by Haggard and his associates,[17] who stated that, although the concentration of alcohol in the ureteral urine is proportional to that simultaneously in the blood, the concentration in the bladder urine may not show this correspondence because the ureteral urine is immediately mixed with urine which has previously accumulated in the bladder. They obtained an average urine-capillary blood alcohol ratio of approximately 1.3 : 1 when urine was voided at thirty minute intervals, but the ratio tended to be somewhat lower during the first hour after the ingestion of alcohol while rapid absorption was taking place. If the specimens of urine were collected at intervals of greater than thirty minutes, the ratios varied considerably. They suggested that after the first hour fairly reliable estimates of the alcohol concentration of the blood may be made from that of the urine by having the subject empty his bladder, discarding this specimen and examining another specimen voided thirty minutes later. Unfortunately, it is frequently impossible to secure even a single specimen of urine from a drunken driver. No doubt the difference in the times of collection of specimens of bladder urine is an important reason for the wide range of ratios obtained in medicolegal cases.

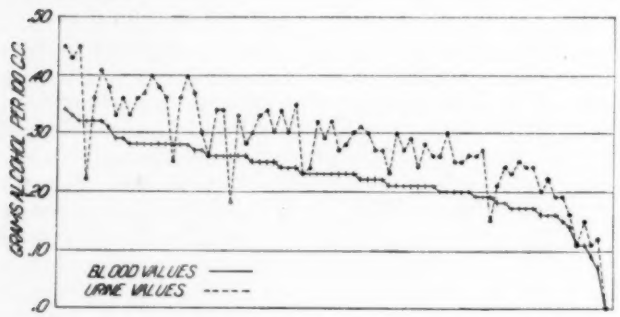

Chart 1.—Venous blood and urine alcohol concentrations in 76 cases.

The possibility of a great variation between the alcohol content of blood and that of urine in the individual case becomes of great importance in drinking driver cases in view of the very definite critical levels of blood alcohol concentration that have been recommended. A small urine to blood conversion error at a blood alcohol concentration near one of the critical levels may profoundly influence the medical and the legal interpretation of the results. The difficulties that may thus arise are demonstrated by some of our experiments.

In 1 case the actual venous blood alcohol concentration was 0.18 Gm. per hundred cubic centimeters and the concentration in the urine was 0.14 Gm. per hundred cubic centimeters thirty minutes after the ingestion of six highballs over a period of two hours. The bladder had last been emptied just prior to the ingestion of the last drink. The blood alcohol concentration calculated from that of the urine by the use of a ratio of 1.3 : 1 was 0.11 Gm. per hundred cubic centimeters. This calculated value is below the 0.15 per cent critical level, although the actual blood concentration was well above this level.

In another experiment the specimens were obtained ten minutes after the ingestion of four highballs over a period of three hours. The urine had accumulated in the bladder for a period of one and one-half hours. The venous blood alcohol concentration was 0.11 Gm. per hundred cubic centimeters, the urine concentration was 0.07 Gm. per hundred cubic centimeters and the calculated blood value would be approximately 0.05 Gm. per hundred cubic centimeters. In this case the calculated value lies just at the lower critical level, although the actual concentration exceeded this by 120 per cent and the subject was slightly intoxicated.

Apparently the extent of the possible errors involved in the calculation of the blood alcohol content from that of the urine has not been realized by many investigators. Since such calculated blood alcohol levels may be grossly inaccurate, any precise conclusions drawn from these figures are unjustified. A widely quoted statement of the Committee on Tests for Intoxication [4] is an example of such a conclusion. The committee has calculated from the data of Holcomb [18] that the average driver with a blood alcohol concentration of 0.15 per cent or more is fifty-five times more liable to have a personal injury accident than is a driver with no alcohol in his blood. At 0.11 to 0.15 per cent the chances are calculated to be 15 to 1; at 0.07 to 0.11 per cent they are 5 to 1, and at concentrations of less than 0.07 per cent they are said to be 3 to 1. That there is such a general increase of liability to be involved in accidents with increasing blood alcohol concentrations cannot be denied, but, since the blood alcohol concentrations were calculated from those of urine or of breath, the actual mathematical relationship reported is questionable.

Breath.—Bogen [10] was one of the first investigators to study the correlation between the concentration of alcohol in the breath and that in the blood and urine. He reported that the alcohol content of 2 liters of expired air was slightly greater than that of 1 cc. of urine. Later Harger and his co-workers [19] developed a method for the analysis of expired air which was based on the assumption that the quantity of alcohol in 2,000 cc. of alveolar air is equivalent to that in 1 cc. of blood. In this method both the amount of alcohol and that of carbon dioxide in a specimen of expired air are determined, and the amount of alveolar air contained in the expired air is calculated on the assumption that 2,000 cc. of alveolar air contains 190 mg. of carbon dioxide. Tests made on a series of 121 persons showed a good average correlation between the amount of alcohol in 1 cc. of blood and the amount accompanying 190 mg. of carbon dioxide in the breath, but there were variations of as much as 50 per cent in individual cases. This method has been widely used in the chemical diagnosis of intoxication.[20]

Jetter and Forrester [21] have developed a method based on similar physiologic principles with the exception that the amount of alcohol accompanying 200 mg. of carbon dioxide is determined. They emphasize a number of possible errors both technical and those relating to the test subject. The authors point out that there may be a normal variation of 15 per cent from the average carbon dioxide content of alveolar air and that this variation may be still greater under abnormal conditions such as acidosis and the alkalosis following emesis. The

17. Haggard, H. W.; Greenberg, L. A.; Carroll, R. P., and Miller, D. P.: The Use of Urine in the Chemical Test for Intoxication, J. A. M. A. **115**: 1680-1683 (Nov. 16) 1940.

18. Holcomb, R. L.: Alcohol in Relation to Traffic Accidents, J. A. M. A. **111**: 1076-1085 (Sept. 17) 1938.

19. Harger, R. N.; Lamb, E. B., and Hulpieu, H. R.: A Rapid Chemical Test for Intoxication Employing Breath, J. A. M. A. **110**: 779-785 (March 12) 1938.

20. Mozes and Katonak.[5] Holcomb.[18]

21. Jetter, W. W., and Forrester, G. C.: The Perchlorate Method for Determining the Concentration of Alcohol in Expired Air as a Medicolegal Test, Arch. Path. **32**: 828-842 (Nov.) 1941.

average degree of correlation between the results of blood and breath analyses by their method was good, but their data show individual errors of as much as 100 per cent, especially at low blood alcohol levels.

Recently Haggard and his associates [22] have stated that the coefficient of distribution of alcohol between air and blood is not 1:2,000 but 1:1,300. They also state that the alcohol concentration in lung air cannot be correctly calculated from that in mixed expired air on the basis of their respective carbon dioxide contents.

In addition to the technical errors inherent in the methods now in general use there is the disturbing possibility, especially at low levels during the rapid absorption of alcohol, that the alcohol concentration of the blood circulating through the lungs may not represent that of the brain. It is apparent, therefore, that much of the work reported in the literature in which the blood alcohol concentration has been calculated by analysis of the breath will not be known for its accuracy.

Blood.—Because of the possible and probable errors involved in the indirect estimation of the blood alcohol concentration from that of urine or of expired air, it is probable that the analysis of the blood itself will demonstrate a closer correlation between the blood alcohol concentration and the severity of the symptoms. Especially will this be true if the alcohol content of the specimen examined is proportional to that of the brain.

Various values have been given for this blood-brain alcohol ratio. Bogen [23] stated that the alcohol concentration in the brain reaches a slightly higher level than that in the blood. Holcomb [18] stated that after absorption the blood-brain ratio is 1.2:1. Stratton [16] reported the blood-brain alcohol relationship in a series of 200 human cases to be as follows: "Percent alcohol Brain equals minus 0.02 per cent plus 1.01 (per cent alcohol Blood)." Newman and Lehman [24] have found that the cardiac blood-brain alcohol ratio is approximately 1.37:1 in rats.

This variety of opinion as to the relative alcohol concentrations of blood and brain might be explained by the statement of Haggard and Greenberg [25] that during the absorption and distribution of alcohol throughout the body the concentration in the blood leaving the brain through the jugular vein is the most reliable easily available indicator of the brain alcohol concentration. They have demonstrated the possibility of considerable variation between the alcohol contents of blood drawn from different sources by an experiment performed on a dog. Alcohol was administered to the fasting animal in a dosage of 3 Gm. per kilogram of body weight, and the alcohol concentrations in specimens of blood obtained from various sources were determined at intervals. Under these extreme conditions the concentration in the arterial blood rose abruptly and that in the jugular blood increased more slowly, while that in the blood from the femoral vein lagged so far behind that it was less than half that of the arterial blood at thirty minutes after ingestion. The concentration in the blood from a skin capillary was slightly higher than that of the jugular blood during rapid absorption. With a decrease in the rate of absorption the four concentrations approached one another in value until they were practically identical after ninety minutes. The authors conclude that the alcohol content of blood drawn from a limb vein during the period of active absorption has "no general significance."

This extreme statement is not supported by the findings of Harger and his associates.[26] These investigators determined the speed with which various parts of the body reach equilibrium in the storage of alcohol by administering varying amounts of alcohol to 53 dogs either intravenously or by mouth. Groups of from 3 to 7 animals were killed at intervals and the alcohol concentrations in various parts of the body were determined. The majority of these dogs were subjected to the same severe conditions which had been employed by Haggard. A summary of some of the results as calculated from their data is presented in table 1.

TABLE 1.—*The Concentration of Alcohol in Blood and Brain of Dogs*

Number of Dogs	Alcohol Administered, Gm. per Kg. Body Weight	Time After Ingestion, Min.	Average Blood Alcohol, Gm. per 100 Cc.	Average Brain Alcohol, Gm. per 100 Gm.	Average of Blood-Brain Ratios	Range of Ratios, per Cent	Average Alcohol Absorbed, per Cent
A. Calculated from Data of Harger and His Associates: [26] Blood Obtained from Saphenous Vein							
4	0.5	30	0.049	0.050	0.98	1.01 ± 7	93.8
4	1.0	60	0.123	0.119	1.03	0.99 ± 11	93.9
3	6.0	30	0.387	0.379	1.01	1.05 ± 7	50.9
4	3.0	15	0.214	0.204	1.05	1.04 ± 6	52.3
4	3.0	30	0.302	0.243	1.28	1.27 ± 17	57.5
7	3.0	60	0.326	0.270	1.24	1.28 ± 14	89.9
4	3.0	90	0.342	0.261	1.35	1.39 ± 19	93.2
7	3.0	120	0.371	0.292	1.29	1.23 ± 21	96.5
4	3.0	180	0.363	0.307	1.21	1.18 ± 8	99.0
4	3.0	720	0.235	0.175	1.35	1.33 ± 8	
30	3.0	30-720	.....	.....	1.28	1.31 ± 26	
4	3.0 (intravenous)	120	0.413	0.316	1.31	1.33 ± 11	
4	3.0 (intravenous)	180	0.351	0.285	1.23	1.24 ± 6	
B. Calculated from Data of Gettler and Freireich: [9] Source of Blood Not Given							
1	4.2	45	0.197	0.153	1.29		
8	1.9-5.6	45-147	.....	.....	1.14	1.17 ± 14	
4	2.3-5.6 (abstainers)	53-147	0.255	0.225	1.11	1.11 ± 8	
4	1.9-4.9 (habitués)	45-146	0.179	0.150	1.17	1.17 ± 14	

A study of the average values for each group of animals indicates that during the early rapid absorption of alcohol under these extreme conditions (3 Gm. of alcohol per kilogram) the brain alcohol concentration increased more rapidly than that of the blood in the saphenous vein. This would be expected from the findings of Haggard and Greenberg.[25] After only fifteen minutes, however, the venous blood concentration had overtaken that of the brain, and at thirty minutes, although absorption was but 57.5 per cent complete and both concentrations were still increasing, the blood and brain were already in alcoholic equilibrium. The actual alcohol concentrations obtained were somewhat greater than those reported by Haggard, but the slope of the curve obtained by plotting time against the alcohol concentration of the blood taken from the superficial

22. Haggard, H. W.; Greenberg, L. A., and Miller, D. P.: The Alcohol Content of Lung Air as an Index of Alcohol in the Blood, J. Lab. & Clin. Med. **26**: 1527-1541 (June) 1941.

23. Bogen, Emil: Tolerance to Alcohol: Its Mechanism and Significance, California & West. Med. **44**: 262-271 (April) 1936.

24. Cited by Jetter, W. W.: A Critical Survey of Various Chemical Methods for Determining the Alcohol Content of Body Fluids and Tissues with Their Physiologic and Medicolegal Significance, Quart. J. Stud. on Alcohol **2**: 512-543 (Dec.) 1941.

25. Haggard, H. W., and Greenberg, L. A.: Studies on the Absorption, Distribution and Elimination of Alcohol: II. The Excretion of Alcohol in Urine and Expired Air and the Distribution of Alcohol Between Water, Blood and Urine, J. Pharmacol. & Exper. Therap. **52**: 150-166 (Oct.) 1934.

26. Harger, R. N.; Hulpieu, H. R., and Lamb, E. B.: The Speed with Which Various Parts of the Body Reach Equilibrium in the Storage of Alcohol, J. Biol. Chem. **120**: 689-704 (Sept.) 1937.

saphenous vein is similar to that obtained by Haggard with blood returning from the brain through the jugular vein; it does not resemble the curve of the blood from the deep femoral vein. The average blood-brain alcohol ratio at equilibrium was approximately 1.28:1, but it should be noted that there was considerable variation between individual animals in the same group. Even when the effects of varying rates of absorption were eliminated by the intravenous administration of alcohol, the individual ratios of this small group of animals varied by as much as 11 per cent from the mean. A disregard of this normal biologic variation has undoubtedly been a source of considerable confusion.

Gettler and Freireich [9] have performed a series of somewhat similar experiments on 8 dogs, 4 of which had been accustomed to the daily ingestion of alcohol over a period of six to twenty-four months. The fasting dogs were given amounts of alcohol varying from 1.9 to 5.6 Gm. per kilogram of body weight, and they were then killed at intervals of from forty-five to one hundred and forty-seven minutes. Some of their results have also been presented in table 1. The source of the blood analyzed is not stated, but at forty-five minutes from the time of the ingestion of a single large portion of alcohol the ratio of the alcohol content of the blood, whatever its source, to that of the brain was essentially that obtained by Harger and his associates with blood from the saphenous vein. The average ratio for all dosages and times was also similar to that obtained by Harger. Apparently the blood-brain ratio was not affected by the drinking habits of the dogs.

TABLE 2.—*Human Blood and Brain Alcohol Concentrations*

	Brain, Gm. per 100 Gm.	Blood, Gm. per 100 Cc.	Blood / Brain	Stomach Contents, Gm. per 100 Gm.	Minimum Time After Last Drink, Hours
1	0.040*	0.040	1.00	0.040	7
2	0.10	0.12	1.20	0.42	2
3	0.10*	0.10	1.00	0.09	2
4	0.12	0.14	1.17	0.60	..
5	0.130	0.145	1.12	0.34	3
6	0.14	0.18	1.29	1.20	..
7	0.15*	0.15	1.00	0.17	1½
8	0.15	0.18	1.20	1.09	..
9	0.16	0.21	1.31	2.40	..
10	0.18	0.20	1.11	1.00	..
11	0.19	0.20	1.05	0.74	..
12	0.19*	0.18	0.95	0.23	7
13	0.22	0.24	1.09	....	1
14	0.22	0.24	1.09	0.50	..
15	0.26	0.29	1.12	0.64	..
16	0.26	0.23	0.88	1.40	..
17	0.27*	0.28	1.04	0.38	4
18	0.28	0.28	1.00	1.20	..
19	0.39*	0.42	1.08	0.46	2
20	0.62†	0.94	1.52	3.20	..

Average blood : brain ratio in first 19 cases: 1.09.
* Cases in which absorption had practically ceased: average ratio, 1.01 : 1.
† Extreme case: drank 5 pints of liquor.

Gettler and Freireich [2] have also reported the results of the analyses of the blood and brain in a series of 15 human cases coming to autopsy. The source of the blood is not stated. They found a considerable variation in the blood-brain ratio, especially at very low alcohol concentrations, in which the effects of varying rates of absorption and the existence of minor technical errors would tend to accentuate any differences between such ratios. If the three sets of data which involve alcohol concentrations of 0.02 per cent or less are omitted there is less variation, and the average ratio is found to be 1.05:1, with a range of 0.63 to 1.47.

We have determined the alcohol concentration of the brain and that of the blood in the right ventricle in a series of 20 coroner's cases, and the results obtained have been presented in table 2. In most instances the autopsies were performed within two to three hours of the time of death. Most of these persons had been involved in automobile accidents, and 9 of them were killed instantly while others died after varying periods of time. Undoubtedly this series of cases represents a fair cross section of the various stages of absorption and of the alcohol concentrations usually encountered in medicolegal work. The 3 persons who lived more than four hours after taking their last drink were undoubtedly in a state of alcoholic equilibrium. The average ratio (grams of alcohol per hundred cubic centimeters of cardiac blood to grams of alcohol per hundred grams of brain) in these 3 cases was 1:1. In each of 6 cases, including these 3, the alcohol concentration of the stomach contents was less than 0.2 per cent higher than that of the blood. The average ratio in these 6 cases in which absorption had practically ceased was 1.01:1, while the average ratio in the other 14 cases in which the stomach contents contained higher percentages of unabsorbed alcohol was 1.15:1. Apparently the blood-brain equilibrium ratio in human beings is lower than that in dogs and that in rats.

The cardiac blood-brain ratios in the entire series of cases representing various stages of absorption varied from 0.88 to 1.52:1. The one extremely high ratio was obtained in a person who died while rapid absorption was still taking place after he had ingested 5 pints of liquor on a wager. With the exception of this 1 case, which is not typical of persons driving automobiles, the maximum difference between the alcohol concentration of cardiac blood and that of the brain in any 1 case was 0.05 per cent of alcohol. The average blood-brain ratio was 1.09:1 with a range of values of 0.88 to 1.31:1.

The data in tables 1 and 2 indicate that even during rather rapid absorption of alcohol in dogs there is a practically constant relationship between the concentration of alcohol in the brain and that in the blood of a superficial vein. In human beings, in the stages of absorption sometimes encountered in medicolegal work, the alcohol concentration of arterial blood may be significantly higher than that of the brain. Under the usual conditions of relatively slow absorption, however, the concentration in the brain tends to lag only slightly behind that of arterial blood. The concentration of alcohol in the blood of a superficial vein may also lag slightly behind that of arterial blood, but under the usual conditions of social drinking the diffusion of alcohol from the capillary blood to the tissues probably keeps pace with the relatively long gradual process of absorption. The results obtained with dogs under extreme conditions would indicate that in drinking drivers the concentration in the venous blood obtained from the usual source, although slightly less than that of arterial blood, is probably essentially that of the brain.

It is apparent, therefore, that the concentration of alcohol in venous blood is the best indicator of brain alcohol concentration in common use. Under the usual conditions in which the specimen is obtained some time after the ingestion of the last drink, both capillary and venous bloods will probably give practically identical results. At concentrations near the legal critical levels, however, the use of capillary blood may possibly result in an unjustified accusation, whereas any slight error involved in the use of venous blood would tend to favor the driver.

In the light of this information, we believe that the critical levels of blood alcohol concentration now so widely employed should be the basis of precise interpretations only when venous blood has been analyzed. At concentrations definitely above the critical levels, however, the other frequently used body materials—capillary blood, urine or breath—will undoubtedly furnish valuable confirmatory evidence of intoxication.

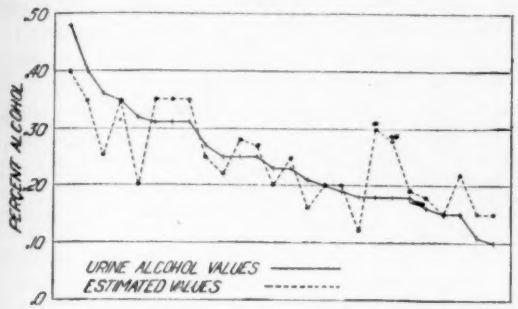

Chart 2.—The results obtained by Heise and Halporn in 26 cases; * injured; ** urine obtained two and one-half hours later.

VENOUS BLOOD ALCOHOL CONCENTRATION AND THE DEGREE OF INTOXICATION

An individual becomes intoxicated by a gradual process and not through a series of definite stages, and for this reason it is frequently difficult to determine the precise extent of this gradual deterioration of physical and mental function. This is especially true because of the fact that the signs and symptoms of intoxication may be altered by such other factors as fatigue and the emotional stability of the individual. Another factor, well known to many drinkers, is the ability of a moderately intoxicated person to increase his self control to some extent under conditions of stress such as those involved in being examined by a police surgeon.

The effect of alcohol on various physical and neurologic functions may be measured rather accurately under controlled conditions in the laboratory, although these precise measurements do not necessarily demonstrate the total effect of alcohol on the individual. In police cases, however, the examining physician must simply observe a series of signs and symptoms and then come to some conclusion as to the intoxication or sobriety of the driver.

We have attempted to correlate the apparent degree of intoxication so determined with the venous blood alcohol concentration in a series of 85 police cases. The clinical examination was based on the recommendations of the National Safety Council, and it included various practical tests of neuromuscular coordination and memory, a search for evidences of disease or injury as well as general observations of the subject and estimates as to the degree of his general orientation and emotional stability. Each such observation is not quantitative, but we believe that the total impression gained by an experienced observer from a thorough examination affords a rather accurate index of the degree of intoxication.

Obviously any correlation between alcohol concentration and the degree of intoxication will depend on the criteria used in making the diagnosis. We have obtained a fairly definite impression as to the extent of various objective and subjective symptoms at different venous blood alcohol concentrations by experimental methods. These impressions, as well as those obtained by a study of the literature and by our experience with fatal cases, have constituted the basis of our criteria for intoxication, although these criteria were undoubtedly slightly modified with increasing experience. Our diagnoses have been made conservatively in light of the fact that these were medicolegal cases and that we might be called on to demonstrate definite evidences of intoxication in court.

The diagnosis of "intoxication" has been made at a point at which slight but definite signs of physiologic and behavior abnormalities are evidenced to a critical observer even under the watchful eye of a police officer. We believe that at this point the effects of alcohol are of such a degree of intensity as definitely to impair the ability of an individual to operate a motor vehicle with safety. This state was found to occur at a blood alcohol concentration of approximately 0.15 Gm. per hundred cubic centimeters or less. This level undoubtedly is higher than the lowest point at which there is a definite impairment of ability to drive an automobile, but it is a practical level for use in medicolegal cases. In some cases there were slight outward signs of intoxication at levels as low as 0.05 to 0.07 Gm. per hundred cubic centimeters, although even at this concentration the subjective symptoms were often considerable. When the alcohol level increased to approximately 0.18 to 0.23 Gm. per hundred cubic centimeters, even an uncritical observer could notice such definite evidences of intoxication as slight muscular incoordination, thick speech and personality changes. The sense of time was frequently disturbed, but the individual was usually rational. As the concentration continued to increase, the extent and number of these changes also increased and the individuals became irrational, unsteady and confused. By the time the concentration had reached a zone of approximately 0.27 to 0.32 Gm. per hundred cubic centimeters the neuromuscular incoordination resulted in a very definite staggering gait and the depressant action of alcohol was evidenced by a condition bordering on stupor. These degrees of intoxication, which were found by rather crude methods, correspond very closely with those described by Muehlberger.[27]

We have concluded that there is a very definite correlation between the degree of intoxication and the venous blood alcohol level, although there is some variation in the degree of intoxication of persons who have the same blood alcohol concentration. This is to be expected in view of the normal biologic variation between individuals. Another probable reason for the observed variation is the fact that each diagnosis involved the judgment of the examiner as well as his observations. Undoubtedly the accuracy of these judgments was affected to some extent not only by the effects on the driver of such factors as apprehension and injury but also by the physical condition of the examiner at the time. Many of these drivers were examined in the early hours of the morning when the effects of fatigue

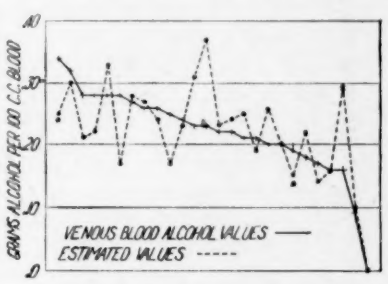

Chart 3.—Results obtained in the first 26 cases; * injured.

27. Muehlberger, C. W., in McNally, W. D.: Toxicology, Chicago, Industrial Medicine, 1937, p. 658.

on both driver and examiner would tend to be pronounced. In spite of the many sources of error, the blood alcohol concentration corresponded with the estimated degree of intoxication in nearly every case.

We have attempted to express this correlation mathematically by following a procedure used by Heise and Halporn.[28] These investigators determined the urine alcohol content of 200 drunken drivers examined by them. They then expressed the correlation between the observed symptoms and the urine alcohol concentration in the next 26 cases by guessing the alcohol content of the urine. The average correlation between the estimated values and the values obtained by analysis of the urine was good, although there were considerable differences in several cases. We have plotted their data in chart 2.

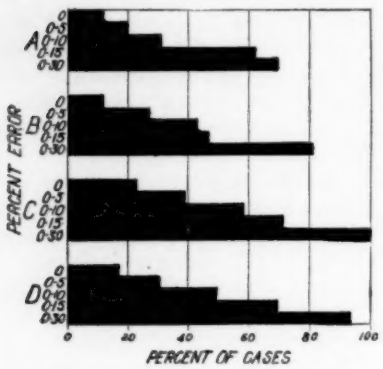

Chart 4.—Accuracy with which alcohol concentrations have been estimated: *A*, Heise and Halporn using urine; *B*, results obtained by us in our first 26 cases using venous blood; *C*, results obtained in our last 31 cases using venous blood; *D*, results obtained in our last 59 cases using venous blood.

The data from our first 26 cases have been plotted in charts 3 and 4. It can be seen from charts 2, 3 and 4, that the blood alcohol values in the first 26 cases were estimated with approximately the same degree of accuracy as that obtained by Heise and Halporn with urine. As the examiner acquired more experience, however, he was able to estimate the concentration with increasing accuracy. This is demonstrated in chart 5, in which the data on the remaining 59 cases are plotted. The one very low estimate was made after the examination of a man who spoke and understood English with difficulty; consequently it was nearly impossible to come to any definite conclusion as to his exact condition, so he was said to be in a subclinical stage of intoxication, and he was held on another charge. The accuracy with which the estimates have been made in a series of 25 consecutive cases is shown in chart 6. The increase in accuracy between the estimates in the first 26 cases and those in the last 31 cases is expressed mathematically in chart 4.

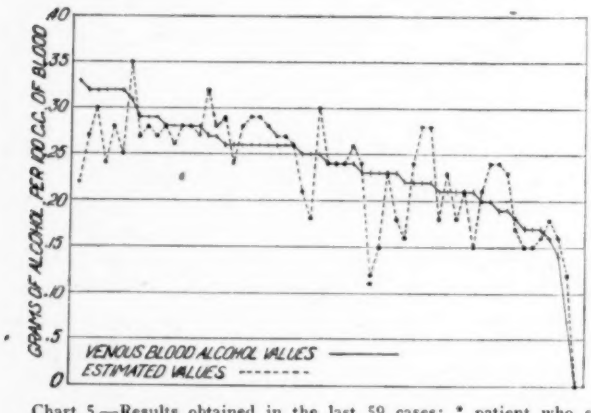

Chart 5.—Results obtained in the last 59 cases; * patient who spoke and understood English with difficulty.

The results of this study indicate that, even though this series of individuals represented a wide range of ages, blood alcohol concentrations, times and drinking habits, there was a very definite correlation between the concentration of alcohol in the blood obtained from a superficial vein in the arm and the degree of intoxication. In each of the last 31 cases the variation between the apparent degree of intoxication, as represented by an estimated alcohol concentration, and the venous blood alcohol concentration was less than 30 per cent. In 71 per cent of these cases the variation was less than 15 per cent. As is to be expected, the correlation existing between the severity of the symptoms and the alcohol concentration of venous blood is considerably greater than that between the symptoms and the concentration in the urine.

SUMMARY AND CONCLUSIONS

1. The chemical determination of alcohol in properly selected specimens is of great value in the diagnosis of intoxication. It also supplies definite objective evidence for use in court.

2. The disagreement in the literature as to the correlation between the degree of intoxication and the blood alcohol concentration is at least partially due to the selection of improper material for analysis.

3. The relationship between the concentration of alcohol in urine and that in blood may vary widely in medicolegal cases. The blood alcohol concentration cannot be calculated from that of urine.

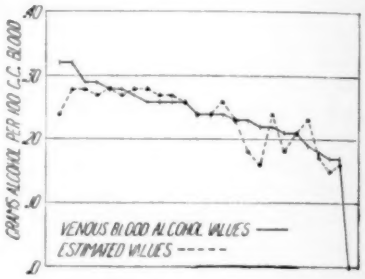

Chart 6.—Results obtained in 25 consecutive cases included in the last 31.

4. The estimation of the blood alcohol concentration by the use of the popular methods of breath analysis is subject to considerable error.

5. The existence of a practically constant ratio between the alcohol concentration of the blood in a superficial vein and that of the brain under the conditions usually encountered in the examination of drinking drivers is indicated by evidence from the literature. Further evidence is afforded by our observations which show the existence of a definite correlation between the apparent degree of intoxication and the venous blood alcohol concentration. This blood-brain alcohol ratio at alcoholic equilibrium is approximately 1 : 1 in human beings.

6. The interpretation of the blood alcohol concentration recommended by the American Medical Association, the National Safety Council and several state laws adequately expresses the correlation between the degree of impairment of the ability to operate a motor vehicle and the alcohol concentration of venous blood. It is suggested, however, that definite recommendations concerning the use and interpretations of breath and urine alcohol determinations be made only after further study. For the present, precise interpretations based on the recommended critical levels of blood alcohol concentration should be made only after the analysis of venous blood itself.

28. Heise, H. A., and Halporn, Benjamin: Medicolegal Aspects of Drunkenness, Pennsylvania M. J. **36**: 190-195 (Dec.) 1932.

WOUND HEALING AND INFECTION AFTER LOCAL IMPLANTATION OF SULFONAMIDE POWDER

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The practice of implanting sulfonamide powder in the wounds of compound fractures after débridement is now well established and is a routine procedure in most hospitals in this country. However, the routine implantation of sterile sulfonamide powder in clean operative wounds for the purpose of preventing infection has not been generally adopted. It is my belief that this is the most important addition to surgical technic since the introduction of rubber gloves and I cannot understand why surgeons have not adopted the method as a routine procedure. It cannot be because they do not encounter operative infections, because I believe that under present conditions the incidence of operative infections is in the neighborhood of 5 per cent. It may be because many surgeons believe that the local implantation of the drug is dangerous or that it interferes with wound healing or that it does not reduce the incidence of operative infections.

In order to prove that the procedure is not dangerous, that it does not delay wound healing and that it does tend to lower the incidence of operative infection, I shall report in this paper all the complications which occurred in 600 consecutive cases in which sulfonamide powder was implanted in operative wounds. This series includes only clean operations in the field of orthopedic surgery and does not include cases of infection, contaminated wounds or compound fractures. All are cases which I followed after performing the operation. If the cases of other members of the orthopedic service were included the series could be enlarged, but the records of consecutive cases would be difficult to obtain and inaccuracies might result.

In February 1939 I examined some of the patients of Jensen, Johnsrud and Nelson [1] and was so impressed by their results that I immediately adopted their method of implanting sulfanilamide powder in compound fractures after débridement. Experiments were performed in an effort to determine whether or not the local implantation of the drug was harmful.[2] These experiments showed that sulfanilamide, sulfathiazole and mixtures of the two drugs in various proportions were well tolerated by the tissues of laboratory animals and could be implanted in wounds in joints, tendon sheaths or body cavities without danger. Unless an unnecessarily large amount of the drug was used there was no appreciable interference with the healing of the wounds.

In May 1939 I began implanting the sterile sulfanilamide powder in clean operative wounds, and data on the first 150 patients were published.[3] In January 1941 sterile sulfathiazole powder was substituted for sulfanilamide and this was used in 100 consecutive cases. Then sterile mixtures of the two drugs in various proportions were used in a similar series.

The series now includes over 600 cases, and the postoperative complications which occurred were three deaths, two infections, one separation of wound edges, five hematomas requiring evacuation, two hematomas evacuated and resutured, two stitch abscesses and no toxic symptoms except fever.

The three hospital deaths which occurred in the series were in no way related to the use of the drug or to infection. The first occurred in a man aged 58 with disabling osteoarthritis of the hip. An acetabuloplasty and an obturator neurectomy were performed. The convalescence was uneventful. On the eighth postoperative morning he was found dead in bed. A complete postmortem revealed only a small amount of atelectasis in the left lower lobe of the lung. The cause of death is unknown. The wounds were healing normally. The second death was of a woman aged 64 who weighed over 300 pounds (over 136 Kg.) and who had a fracture of the hip. This was reduced by the open method and nailed under general anesthesia. The postoperative convalescence was unsatisfactory in that the patient suffered with distention and nausea and did not take fluids or food well by mouth. In spite of much intravenous fluid she died on the eighth postoperative day. The postmortem revealed acute myocarditis, colitis and atelectasis in the right lung. The wound was healing normally. The third patient who died was a senile man aged 84 whose fractured hip was nailed by the open method under local anesthesia. The patient was irrational and incontinent and frequently removed the dressing from his wound. Several stitch abscesses developed along the suture line. He died in his sleep on the sixty-third postoperative day. The postmortem revealed senile arteriosclerosis and pulmonary edema. At this time his wound was healed and he was walking a little without support, as he would not try to use crutches.

The two infections were late, mild and avoidable. The first occurred in a boy aged 4 years who had a large lymphangioma removed from the thigh. He returned to the hospital eighteen days after the operation with fever and a large collection of lymph in the wound. This was evacuated by forcing a hemostat through the thin scar, and the wound healed promptly. The second occurred in a man aged 42 who suffered a severely comminuted subtrochanteric fracture of the femur. This was reduced under local anesthesia and the fragments were fixed with a Neufeld nail. A hematoma developed in the distal portion of the wound, and on the fifteenth postoperative day this was evacuated and found to be infected. The infection was superficial to the deep fascia and the wound healed promptly after it was evacuated. The first infection could have been prevented by the pressure dressing which the parents were instructed to keep on and the second by an early evacuation of the hematoma.

The 2 patients with stitch abscesses were the man referred to who was irrational and incontinent after his hip was nailed and a woman who was operated on for internal derangement of the knee. The internal semilunar cartilage and an avulsed tibial spine were removed. She was permitted to walk on the fourth postoperative day, and three stitch abscesses were noted two days later. The skin sutures were removed, the

From the Department of Surgery of the Washington University School of Medicine.

1. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: The Local Implantation of Sulfanilamide in Compound Fractures, Surgery **6**: 1-12 (July) 1939.

2. Key, J. A., and Burford, T. H.: The Local Implantation of Sulfanilamide in Compound Fractures, South. M. J. **33**: 449-455 (May) 1940. Key, J. A.; Frankel, C. J., and Burford, T. H.: The Local Use of Sulfanilamide in Various Tissues, J. Bone & Joint Surg. **22**: 952-958 (Oct.) 1940. Key, J. A., and Frankel, C. J.: The Local Use of Sulfanilamide, Sulfapyridine and Sulfamethylthiazole, Ann. Surg. **113**: 284-297 (Feb.) 1941. Harbison, S. P., and Key, J. A.: Local Implantation of Sulfanilamide and Its Derivatives in Wounds, Arch. Surg. **44**: 22-26 (Jan.) 1942.

3. Key, J. A., and Burford, T. H.: The Prophylactic Implantation of Sulfanilamide in Clean Operative Wounds for the Reduction of Postoperative Infections, Surg., Gynec. & Obst. **73**: 324-332 (Sept.) 1941.

knee put at rest and sulfathiazole given by mouth. The deeper layers of the wound were not involved. She left the hospital on the thirteenth postoperative day with the wound healed. She stated that on five previous occasions she had had subcutaneous abscesses around this knee.

Hematomas developed in the wounds of 5 patients and some old blood was evacuated when the sutures were removed: 1. A man who had an Ober fasciotomy

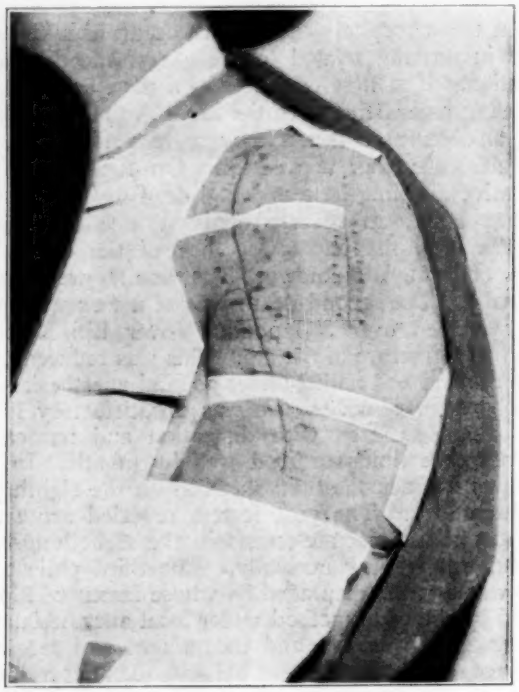

Fig. 1.—Two wounds immediately after removal of sutures from the larger wound. Smaller biopsy wound is 16 days old and the larger wound 10 days old. The proximal third of the humerus was excised with a sarcoma and the proximal third of the fibula was transplanted to the shoulder.

developed a large hematoma, and blood clot was pressed out on several occasions after the sutures were removed. 2. A man from whom an osteoid osteoma of the tibia was removed had a rather large dead space in the wound, and some old blood was pressed out when the sutures were removed. 3. A girl aged 14 years with an old slipped epiphysis of the hip developed a hematoma in the lower end of the wound after an osteotomy of the neck of the femur and fixation with a nail. This drained for a few days after the sutures were removed. Similar hematomas occurred in the wounds of the 2 obese women with old subtrochanteric fractures which were fixed with Neufeld nails. In all of these sulfathiazole was sprinkled or pushed into the opening and the wounds healed without infection.

In 2 instances the wounds were opened on the second postoperative day and large hematomas were evacuated, clotted blood was removed and the wound was then sprinkled with sulfathiazole and sutured. Both healed without further complications. One was a lumbosacral fusion; in the other the tip of the spinous process of the first thoracic vertebra and a considerable amount of the surrounding fascia were excised in order to relieve persistent pain complained of by a woman.

In 1 instance after a lumbosacral fusion a wound was opened because of pain and fever. No infection was found. This patient developed a decubitus ulcer which later involved the lower portion of the wound and necessitated a second operation and suture for healing.

In 1 instance the skin edges separated and the wound healed by epithelization. The patient was a young man whose clavicle had been excised the preceding year. He returned with a rather large local recurrence of the sarcoma. This was excised with the overlying skin and a rather wide area of the surrounding tissue, including part of the acromion. This left a considerable dead space covered by skin flaps under moderate tension. When the pressure dressing and sutures were removed the skin margins retracted about half an inch. Sulfathiazole powder was sprinkled on the exposed hematoma, and the wound healed without infection.

It is to be noted that with two exceptions all the operations in which the aforementioned hematomas developed were done under local anesthesia with procaine hydrochloride which contained four drops of 1:1,000 epinephrine to the ounce. This technic causes the surgeon to omit the ligation of some vessels, which may bleed later. It is also to be noted that three hematomas including the one which became infected occurred after operations in which a Neufeld nail was used. This is because the fixing of the long plate attached to this nail necessitates considerable trauma to the vastus lateralis muscle.

With the foregoing exceptions all the wounds healed satisfactorily and in no longer time than would be required by similar wounds in which the sulfonamide powder had not been implanted. In most instances the sutures were removed on the sixth, seventh or eighth postoperative day. In large wounds in obese patients they were left for ten days or more. In many instances cross straps of adhesive were used to relieve the tension on the skin after the sutures were removed.

In cases in which plaster casts were applied over the wound the sutures were usually left in until the cast was removed, often several weeks later. In none of these cases did stitch abscesses or skin infections develop, because sulfonamide powder was sprinkled on the suture line before the dressing and cast were applied.

As explained in the preceding article,[3] the operative technic used was not especially elaborate and silk or cotton was used for ligatures and sutures. The technic differed from that used in the past in no way except that in this series sulfanilamide, sulfathiazole or a mixture of these two powders was implanted in the wound just before it was closed.

In view of the experience reported in this paper it is in order to mention a recent paper by Bick[4] in which he reports clinical observations on the healing of 50 traumatic and operative wounds. He states that "there was no question but that wound healing was delayed when powders were implanted locally" and "the delay was considerable, representing on the average between 50 and 75 per cent of the time factor." He further stated that the scar of the treated group remained broader at equivalent intervals than did the scars of the controls and that the delay in healing causes longer hospitalization and postpones necessary active motion and massage.

In answer to the foregoing, I believe that Bick used too much powder in a given wound or distributed it improperly. Also the daily inspection did not help

4. Bick, E. M.: Observations on Topical Use of Sulfonamide Derivatives, J. A. M. A. **118**: 511-513 (Feb. 14) 1942.

the healing. On the day on which Bick's paper was called to my attention 2 patients had their sutures removed. These were photographed (figs. 1, 2 and 3) and I believe that their appearance is typical of the wounds of this series and is approximately the same as that of similar clean wounds without the local implantation of sulfonamide powder. In following the 600 cases reported in this series I have noted no difference between the scars and those in other cases in which similar operations were performed in the past and sulfonamide powder was not implanted in the wounds.

In regard to hospitalization, this period was not lengthened but was often shortened, as many patients were permitted to go home earlier than usual because of the added factor of safety from infection obtained by the implantation of a sulfonamide compound in the wound. This is particularly true of out of town patients (fig. 3). The diagnosis, type of operation, highest temperature, days in the hospital and character of the healing of the wounds in the first 150 cases in this series are given in the preceding paper on this subject.[3] Repetition of the data on the entire series would needlessly lengthen this paper.

METHOD AND CHOICE OF DRUG

Since the drug is not bactericidal it should be sterile when it is placed in the wound. Sterile packages containing 5 Gm. each of sulfanilamide or of sulfathiazole or of a mixture of the two can be obtained from many drug houses. Or the drug can be sterilized in glass tubes or bottles by autoclaving at 18 pounds pressure for twenty minutes. This method will not kill all spores, as the bottles are stoppered with gauze and paper, but it has proved satisfactory in some hundreds of cases.

In wounds contaminated with staphylococci, sulfathiazole is the drug of choice, but in clean wounds sulfanilamide is equally satisfactory. On theoretical grounds I prefer a mixture of two parts of sulfanilamide and one part of sulfathiazole in clean wounds. In the first 150 cases of this series sulfanilamide was used, in the next 100 cases sulfathiazole was used, and in the next 100 cases various mixtures of the two drugs were used. There was practically no difference in the results.

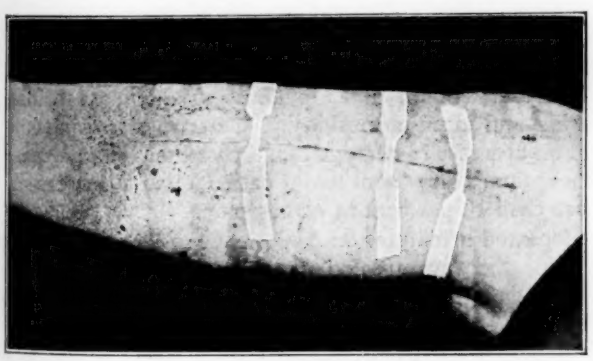

Fig. 2.—Leg wound of same patient ten days after operation immediately after removal of the sutures.

The two infections occurred in wounds in which sulfanilamide was used, but, as has been explained, these infections occurred long after the drug had disappeared from the tissues and could have been prevented by proper after-care. I prefer the mixture but do not hesitate to use either of the drugs alone if the mixture is not available.

There has been some discussion about the form of the drug. I have used a fine powder, fine crystals and rather coarse crystals and find no difference in the results. It is soon dissolved in the fluid in the wound unless it is permitted to form aggregates or lumps. The crystals flow more easily but are heavier and do not cover as much surface per gram. A sterile salt shaker containing 5 Gm. of the drug is on the instrument table and this is enough for most operations, and a little is saved to sprinkle along the suture line after the wound is closed. Usually a good deal is left in the shaker. Occasionally in extensive incisions part of a second 5 grams is used. The powder is sprinkled over the surface and is then smeared with the fingers so that no aggregates are left and the drug reaches the entire area of the wound. In large joints a gram or more is dropped in the joint and smeared around a bit before the synovial surface is closed. After the subcutaneous sutures are tied the skin margins are wiped with the finger to remove any excess of the drug.

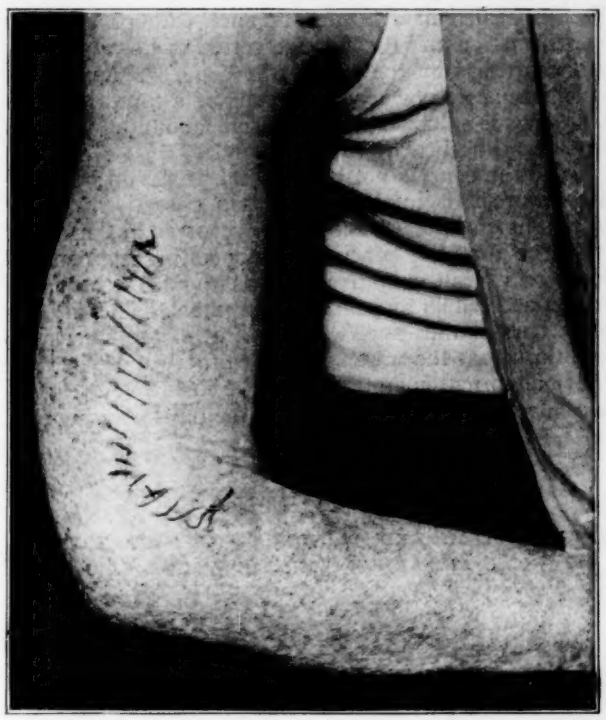

Fig. 3.—Sutures in place four weeks after operation. The radial nerve was sutured and a step-cut operation was done for nonunion of the humerus. Patient left hospital on the fourth postoperative day in a hanging cast.

Not over 10 Gm. has been used in any clean wound. As no toxic symptoms other than fever have been noted in any of the patients, no record is kept of the exact amount of drug implanted, nor is the blood level of the drug determined. A postoperative elevation of the temperature to 38.6 F. occurred in approximately 5 per cent of the patients. Whether or not this was caused by the drug, I do not know. At any rate it subsided quickly and did no harm. Rashes have occurred in some patients who were also taking the drug by mouth and one such patient had hematuria. These patients had osteomyelitis and were not included in this series.

SUMMARY

The local implantation of sulfonamide powder in the clean operative wounds is a safe procedure and lowers the incidence of operative infections. In over 600

consecutive cases there were no toxic symptoms, except fever, which occurred in about 5 per cent of the cases and may or may not have been caused by the drug. In these cases the total postoperative complications were 3 deaths, 7 hematomas, 1 separation of wound margins, 2 stitch abscesses and 2 infections. The 2 infections were mild and developed late. In the other cases the wounds healed in a normal manner without excessive scar formation and the average period of hospitalization was shortened by the use of the drug. Sulfanilamide or sulfathiazole powder or crystals or a mixture of the two drugs is suitable. An excessive amount of the drug may delay the healing of the wound.

Since the drug is not bactericidal, it should be sterilized before it is implanted in clean operative wounds.

In view of the favorable results reported in this paper, I believe that the practice of implanting sulfonamide powder in clean operative wounds should become routine in all civilian and military hospitals. This is especially true at this time when, owing to the emergency resulting from the war, so much surgery must be done under abnormal conditions and the incidence of operative infection may be expected to be unusually high.

PHENOTHIAZINE

EXPERIMENTAL AND CLINICAL STUDY OF TOXICITY AND ANTHELMINTIC VALUE

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AND
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Our interest in phenothiazine as an anthelmintic agent was stimulated by Manson-Bahr's report [1] on its effectiveness in threadworm and roundworm infections in man. An additional stimulus was provided by the preliminary report of the Council on Pharmacy and Chemistry,[2] which stated that phenothiazine [3] had interesting possibilities and that further investigations would be useful for a proper evaluation of its therapeutic value. Our studies have shown that phenothiazine is not an effective anthelmintic and in human beings and in rats is capable of causing toxic reactions.

Our program of study was divided into three categories: (1) an experimental study on rats, (2) blood and urine studies in human beings and (3) a study of phenothiazine as an anthelmintic.

CHRONIC TOXICITY STUDY IN RATS

A chronic toxicity study of the effects of repeated oral doses of phenothiazine was carried out as follows: Two groups of 10 male albino rats each were maintained on a diet of ground Purina Dog Chow. Sufficient drug was mixed with the diet of one group to make it 0.5 per cent with respect to phenothiazine content. The other group served as a control group. The experiment was continued for eighteen days. The total drug consumed per rat averaged 1,420 mg., or 390 mg. per kilogram per rat.

From the Department of Medicine, New York Post-Graduate Medical School and Hospital.

1. Manson-Bahr, Philip.: Phenothiazine as an Anthelmintic in Threadworm and Roundworm Infections, Lancet **2**: 808 (Dec. 28) 1940.
2. Phenothiazine, Preliminary Report of the Council on Pharmacy and Chemistry, J. A. M. A. **115**: 1721 (Nov. 16) 1940.
3. Phenothiazine was furnished through the courtesy of Burroughs Wellcome & Co. (U. S. A.) Inc., New York.

The treated animals were unkempt and depressed and apparently excreted the drug or its degradation products in the urine, as was shown by the magenta colored spots which were found on the paper under the cage.

At the end of the experiment the animals were killed and examined. No gross pathologic lesions were found. Microscopic examinations of the essential organs, including the bone marrow, were made. Examination of the bone marrow revealed hypoplasia of all cellular elements in 1 rat and normoblastic hyperplasia in another. The latter is generally regarded as evidence of peripheral blood destruction. Sections of the livers, spleens, kidneys, gastrointestinal tracts, adrenals and brains were without any significant changes from the normal controls.

HUMAN TOXICITY STUDY

Twenty-four patients attending an outpatient clinic were studied during a course of phenothiazine. These patients had long standing diseases such as chronic ulcerative colitis and lymphogranuloma venereum or had intestinal infections with various helminths or protozoa. None of the patients treated had acute infections, so that for the purpose of this study we can reasonably assume that any significant changes in blood or urine during phenothiazine therapy were due to phenothiazine and not to the disease. A complete blood count and urinalysis were made before therapy was begun and were repeated twice weekly while the patient was receiving phenothiazine and once or more times after the drug was stopped.

A full course of phenothiazine for an adult consisted in giving 1⅓ Gm. three times daily for ten days, making a total of 40 Gm.

Results of red blood cell counts were as follows: Six patients had no decrease in their counts during or at the end of therapy, 11 patients had a decrease in red blood cell count up to 500,000 per cubic millimeter, 4 had a decrease of from 500,000 to 1,000,000 per cubic millimeter and 3 had a decrease in red blood cells of more than 1,000,000. During therapy, examination of the blood smears frequently showed anisocytosis and poikilocytosis, and erythroblasts were found in one smear.

The hemoglobin of 23 patients was studied before, during and after phenothiazine therapy. Five patients had no decrease in hemoglobin, 9 patients had a decrease of less than 10 per cent and 9 patients had a decrease of more than 10 per cent in hemoglobin.

Repeated urinalyses on 23 patients undergoing phenothiazine therapy revealed that 13 showed no abnormal constituents during therapy, 6 developed a trace of albumin, 1 developed a considerable amount (3+). Two patients showed cylindroids during therapy and 1 showed hyaline and cellular casts. Crystals of an undetermined nature that polarized light were found in the urine of 1 patient. The urine was a brownish red mahogany color while the drug was being taken.

Complete white blood cell counts were not significantly altered in any of the patients during or after therapy except for the finding of an occasional myelocyte in the smears of 2 patients and metamyelocytes in the smear of 1 patient.

Side effects of nausea and vomiting were manifested by 2 patients and nausea alone by 1; the amount of phenothiazine taken in these cases was 6 Gm., 18 Gm. and 40 Gm. respectively.

EFFECT ON INTESTINAL PARASITES

Private patients and patients attending an outpatient clinic were studied. These patients had a variety of intestinal parasitic infections and they were all given a course of phenothiazine in order to determine if this drug is therapeutically effective as an anthelmintic in infections caused by intestinal parasites. Study, therefore, was not made on any one type of infection but rather on a cross section of parasitic intestinal infections. The results are summarized in the table.

The usual dose schedule in this study of phenothiazine was as follows: for children 2 to 6 years of age, ⅔ Gm. twice daily for ten days (13 Gm. total), for children 6 to 12 years of age ⅔ Gm. three times daily for ten days (20 Gm. total), for adults 1⅓ Gm. three times daily for ten days (40 Gm. total). In some of the patients this course of treatment was repeated after a rest period of two weeks. The results are summarized in the table and are detailed as follows:

Results of Treatment

Parasite	Stool Examination: Before Treatment Number of Patients	After Treatment: Patients Positive	After Treatment: Patients Negative
Enterobius vermicularis	10	8	2
Hookworm	3	3	0
Ascaris lumbricoides	2	2	0
Taenia saginata	2	2*	0
Schistosoma mansoni	1	1	0
Trichuris trichiura	9	9	0
Endameba histolytica	3	2	1
Endameba coli	7	7	0
Giardia lamblia	3	3	0
Iodameba buetschlii	2	2	0
Diendameba fragilis	1	1	0
Endolimax nana	1	1	0
Totals	44	41	3

* In one case, after treatment with oleoresin of aspidium, the head was obtained.

Enterobius vermicularis (pinworm): Ten patients with pinworms were treated with phenothiazine. The total dose for children ranged from 13 to 25 Gm. and for adults from 25 to 100 Gm. The criteria for cure were three negative NIH swabs. Eight cases remained positive after treatment. Two were considered cured of the infection.

Hookworm: Three adult patients with hookworm infection were treated with total doses ranging from 28 to 93 Gm.; all remained positive after the course of treatment.

Ascaris lumbricoides (roundworm). Two patients with roundworms were each given a total of 40 Gm. of phenothiazine; ova were present following treatment.

Taenia saginata: One patient was given a total of 30 Gm. of phenothiazine; the head of the worm was not recovered. Following this, oleoresin of aspidium was given and the head obtained. Another patient was given a total of 93 Gm. and the worm head was not obtained.

Schistosoma mansoni: One patient with this infection was given a total of 58 Gm.; the stool remained positive.

Trichuris trichiura (whipworm): Nine patients with whipworm were treated with phenothiazine with total doses ranging from 13 Gm. in a 2 year old child to 93 Gm. in 1 of the adults. In all cases ova were found in stool examinations following treatment.

Endameba histolytica: Three patients with this ameba in the stool were treated with phenothiazine in total doses of from 6 to 30 Gm. On subsequent examination 1 of the 3 had three negative stools following a total of 10 Gm.

Endameba coli: Seven patients harboring this organism were treated with total doses ranging from 8 to 40 Gm. and all cases remained positive following treatment.

Giardia lamblia: Three patients harboring this flagellate were treated with total doses ranging from 13 Gm. (2 year old child) to 28 Gm. in an adult; stools of all 3 remained positive.

Iodameba buetschlii: Two patients were given a total of 36 Gm. (child of 8) and 40 Gm. (adult) respectively of phenothiazine; stools of both were positive following treatment.

Diendameba fragilis: One patient with this amebic infection was given a total of 68 Gm., after which the stool still remained positive.

Endolimax nana: One patient with this infection was given a total of 68 Gm.; the stool remained positive.

SUMMARY AND CONCLUSIONS

1. The effects of repeated oral doses of phenothiazine were studied on rats. The only abnormal findings on microscopic examination of the essential organs were hypoplasia of all cellular elements in the bone marrow of 1 rat and normoblastic hyperplasia of the bone marrow in another.

2. Blood and urine studies during courses of phenothiazine therapy in 24 human beings showed a decrease of more than 1,000,000 red blood cells per cubic millimeter in 3 cases, a decrease of more than 10 per cent in hemoglobin in 9 patients, a trace of albumin in the urine of 6 patients and a pronounced amount in 1 patient, cylindroids in 2 patients and hyaline and cellular casts in 1 patient. Two patients developed nausea and vomiting.

3. Forty-four patients with intestinal parasitic infections of various types were treated with phenothiazine. Only 3 could be classified as being clinically cured. Of these 3, 2 had pinworm infections and the other an Endameba histolytica infection.

4. From our clinical and experimental study of phenothiazine in human beings and rats it appears that this drug is capable of causing toxic reactions in an appreciable number of patients.

5. It was not an effective anthelmintic or amebicide in the patients studied.

Hypnotism.—Genuine hypnotism actually stands in the same category as chemistry, physics or mathematics. It is based on definite basic laws and principles which have been discovered by patient experiment and research; and just as astronomy has evolved from the superstitions of astrology, and chemistry from the medieval search for the magical "philosopher's stone," so hypnotism has evolved from the "mesmerism" of the eighteenth and nineteenth centuries into a true science, a branch of the great subject of the human brain and human consciousness. The main facts and rules on which the science of hypnotism are based are known to all competent students of the subject, just as the general laws of chemistry are known to chemistry students. . . . There can be no doubt that hypnotism may be of great aid in curing many types of human disease. At the present moment, however, it has practically no real value in America. This is due entirely to popular prejudice, that curious quirk in human thinking which sees in hypnotism something closely allied to black magic and the supernatural. We must not blame the medical profession if our own ignorance and superstition rob them of this very valuable device for combating human ailments. First, we must educate ourselves. We will then find that the doctor is the most easily educated of all humanity.—Estabrooks, G. H., professor of psychology at Colgate University, Hypnotism, New York, E. P. Dutton & Co., Inc., 1943.

ACUTE TYPHOID CHOLECYSTITIS

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Acute cholecystitis may be of typhoid origin. The failure to detect this association may result in grave consequences. Because of the relative infrequency of typhoid and its complications in modern medical practice, one rarely thinks of this disease when confronted with a case of acute cholecystitis. This report reviews 4 cases of acute typhoid cholecystitis to reemphasize the importance of this complication of typhoid. Two of the 4 cases came to operation before the association with typhoid had been established. In 2 instances secondary attacks occurred among the personnel of the hospitals to which the patients had been referred for operative procedures.

The localization of the typhoid bacillus in the gallbladder during the course of typhoid has become common knowledge since the report of Gilbert and Girode [1] in 1890. Chiari [2] in 1894 recovered this organism from the gallbladder in 19 out of a total of 22 cases of typhoid which came to postmortem examination. Nevertheless, clinical evidence as to the invasion of the gallbladder is demonstrated by a comparatively small percentage of cases of typhoid. Hölscher [3] observed gross changes in the gallbladder in only 5 out of 2,000 postmortem examinations performed in cases of typhoid. Keen [4] in 1898 recorded 30 cases of typhoid cholecystitis. In 1907 Thomas [5] collected 154 cases of typhoid complicated by acute cholecystitis. In 39 of these, perforation of the gallbladder occurred. In the following year Ashurst [6] reported 21 operative cases of acute typhoid cholecystitis. Since 1916, although foreign reports have been quite numerous, references to this condition have been infrequent in the English and American literature.[7] With one exception [8] the reported cases have been concerned primarily with acute typhoid cholecystitis in children.

In 1920 Reid [9] made the observation that pain and tenderness in the right upper quadrant associated with slight muscle spasm may be encountered during the course of typhoid. In most cases the symptoms of gallbladder involvement subside without the necessity of surgical intervention. When, however, the damage to the gallbladder is more extensive, surgery may become necessary. In such cases a definitely distended gallbladder is usually found at operation.

The signs and symptoms of acute cholecystitis may become manifest during the course of typhoid or after convalescence has been established. In the majority of cases they are first noted after the second week of the fever. Exceptionally the gallbladder complication appears at the very onset of the underlying disease. Panayotatou [10] reported a case of primary typhoid cholecystitis in 1920. A similar report was made by Mussio-Fournier and his associates [11] in 1928.

Perforation of the gallbladder is a serious end result of acute typhoid cholecystitis. Liège and Folliasson [12] in 1931 reviewed 35 published reports of cases in children. These authors remarked on the frequency of perforation in their series. This outcome occurred in 16, or 46 per cent, of the entire group. In several of their cases it was noted that evidence of perforation was found only a few hours after the onset of clinical signs of gallbladder involvement. Emphasis is placed on the necessity for operative intervention in perforated cases. Failure to operate results in 100 per cent mortality. Salmon [13] reported a case of acute eberthian cholecystitis associated with biliary peritonitis. At operation, although the gallbladder was large and distended, no visible break could be detected in the wall.

Statistical studies indicate that jaundice is one of the rarest complications of typhoid. Only 52 cases were recorded by DaCosta.[14] McRae [15] noted only 8 cases in a series of 1,500. The cause of the icterus associated with typhoid is variable. Jaundice may be one of the signs associated with acute typhoid cholecystitis. However, all jaundiced cases of typhoid do not necessarily show gallbladder damage. Petridis [16] reported a case of fatal typhoid in which the jaundice appeared at the very onset of the illness. The icterus in this case was not associated with gallbladder disease but seemed rather to have been the result of a diffuse hepatitis. Berry [17] reported a case of typhoid with icterus and thrombocytopenic purpura. Autopsy revealed no gallbladder involvement. Hence it is obvious that the presence of jaundice in a case of typhoid need not necessarily be indicative of a complicating acute cholecystitis.

REPORT OF CASES

CASE 1.[18]—Dr. R. S., a house officer aged 25, married, was admitted to the medical service of his own hospital on Dec. 16, 1941 with complaints of malaise, generalized pains and aches and fever. He had been perfectly well until three days prior to admission, when he had noticed that he tired easily. The temperature at this time was normal. In twenty-four hours the patient became aware of generalized pains and aches associated with slight soreness of the throat. On the following day, when it was found that the temperature was elevated, he was admitted to the hospital. On admission physical examination was essentially negative except for diffuse redness of the throat.

Examination of the blood showed a red cell count of 5,700,000 with a hemoglobin content of 96 per cent, and white cell counts varying from 3,500 to 7,300; the blood smear showed 69 per cent neutrophils, 20 per cent lymphocytes, 10 per cent

From the Division of Communicable Diseases, Massachusetts Department of Public Health.

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18. This epidemiologic investigation has been reported in detail.[10]

mononuclears and 1 per cent eosinophils. Urinalysis was negative. The blood serum agglutination reactions against typhoid showed a gradual rise in titer from 1 plus in a dilution of 1:40 on December 17 to 2 plus in 1:320 on January 6. A blood sample submitted for a Widal test to the state laboratory was reported positive on December 30. A stool culture was positive for Eberthella typhosa.

The temperature remained elevated for about ten days. The course was mild and uneventful except for an attack of acute pain in the right upper quadrant on December 25. The pain was severe and radiated to the right part of the back and the right side and was relieved only after the administration of morphine. The attack was associated with spasm over the region of the gallbladder. Tenderness in the right upper quadrant persisted for five days. The temperature became normal on the eleventh hospital day. There was no recurrence of gallbladder symptoms. The diagnosis was typhoid fever, acute typhoid cholecystitis.

CASE 2.[18]—Mrs. S. R., a housewife aged 28, was admitted to the hospital on Dec. 6, 1941 with the chief complaint of pain in the right upper quadrant of one day's duration. About three weeks before admission, a severe infection of the upper respiratory tract, associated with "heaviness of the chest" and productive cough, appeared. About a week later the patient noticed that she tired more easily than usual. Her arms and legs felt heavy. She could scarcely "stand on her legs." After this feeling of tiredness had persisted for about a week she found that her temperature was 104 F. She consulted a physician, who advised bed rest. The fever persisted. On December 1 she became aware of a dull ache in the right upper quadrant. This subsided until twenty-four hours prior to admission, when the pain returned with increasing severity. It was intense and colicky and radiated to the back. She became nauseated and vomited several times. There was no jaundice and no clay colored stools. The past history revealed an attack of pain in the right upper quadrant one year previously which had lasted for three days.

On admission, the temperature was 103.4 F., and the pulse rate 120. On physical examination the patient was alert, feverish and restless and in obvious distress. General examination was otherwise negative except for spasm and tenderness in the right upper quadrant. Examination of the blood showed a white cell count of 8,050, a red cell count of 4,130,000 and a hemoglobin content of 70 per cent. Urinalysis was negative. The icterus index was 11.

On December 7, the gallbladder was removed under spinal anesthesia. It was tense, edematous and inflamed, with several small areas of necrosis. No stones were found.

Following operation, the patient had a spiking temperature. On December 9, two days after operation, the white cell count was 9,000. The temperature on that day was 101.4 F. The temperature gradually subsided and was normal on December 24. Except for the temperature, the course was uneventful, and the patient was discharged on December 27.

On January 21, about six weeks after operation, the Widal reaction was found to be positive. E. typhosa was recovered from the stools at the same time. The diagnosis was typhoid fever, acute typhoid cholecystitis.

CASE 3.—Miss L. B., aged 29, white, was admitted to the hospital on July 12, 1936 with the chief complaint of pain in the right upper quadrant. She had been perfectly well until July 1, when she noted onset of a severe frontal headache. Her physician found that she had a temperature of 102 F. Several days later she began to have severe chills at irregular intervals for about forty-eight hours. Two days prior to admission there was sudden onset of sharp, crampy pain in the right upper quadrant, radiating at times to the right shoulder. There was persistent anorexia, nausea and intractable vomiting. One day prior to admission there appeared a profuse diarrhea which lasted for several days. The sharp pain was intermittent, leaving a dull, constant ache. There was no past history of any gastrointestinal symptoms. The patient had never been jaundiced in the past.

Physical examination showed that the patient was well developed and well nourished and was in obvious distress. The temperature was 102 F., the pulse rate 104. Positive physical findings were limited to the abdomen, which showed decided hyperesthesia, spasm and tenderness in the right upper quadrant. The gallbladder could not be felt. Laboratory examination on July 12 showed a white cell count of 25,500. Urinalysis was negative except for a few granular casts in the sediment. A flat plate of the gallbladder region showed no evidence of stones. The gallbladder could not be outlined.

Operation was performed on July 13, one day after admission. A large, distended gallbladder was found, matted down to the liver bed by adhesions. The liver appeared slightly enlarged. The gallbladder was acutely inflamed and surrounded by heavy plastic exudate. Cholecystotomy was performed. Following operation the temperature remained elevated, spiking between 99 and 103 F. for ten days. During the course of the succeeding six days it subsided gradually and became normal on July 29, seventeen days subsequent to admission and twenty-eight days after the onset of her illness. The white cell count postoperatively varied from 7,100 on July 15 to 9,600 on August 1; the blood smear on August 1 showed 54 per cent neutrophils, 39 per cent lymphocytes and 7 per cent monocytes; the red cell count was 3,480,000. On July 17 the Widal reaction was reported positive for typhoid. A positive stool culture for E. typhosa was obtained on August 11. Following the subsidence of the temperature, recovery was uneventful. The patient was discharged on August 11. The diagnosis was typhoid fever, acute typhoid cholecystitis.

Following discharge from the hospital, the stool cultures continued to be positive. When this condition persisted for one year from the onset of the illness, the patient's name was added to the carrier list. To cure the carrier condition, cholecystectomy was performed in April 1938. Laboratory data subsequent to this operation finally indicated that the patient had been relieved of the carrier state. The patient's name was therefore removed from the carrier list.

CASE 4.—Miss A. H., aged 29, white, was admitted to the hospital Sept. 16, 1938. She had been well until September 11, when there was onset of persistent cough, headache and fever. There was no past history of any similar illness. There was no history of any previous gastrointestinal symptoms. On admission, the temperature was 102.2 F., pulse rate 108 and respiratory rate 16. Physical examination was entirely negative. Laboratory examination revealed a red cell count of 3,400,000 and a white cell count of 9,600. The smear showed 85 per cent polymorphonuclears and 15 per cent lymphocytes. Urinalysis was negative.

The temperature remained elevated. On September 19 the patient felt somewhat improved in spite of the high temperature. On September 22 diarrhea was noted for the first time. Her condition became aggravated and she became listless and disoriented. Five days later, September 27, she began to complain of headache and occasionally of abdominal pain. Because of her mental condition, the pain was difficult to localize. On October 3 it had increased in severity, and apparently an ice bag gave some relief. A chest plate at this time was reported as within normal limits. For the next ten or eleven days the patient continued to have intermittent abdominal distress, and physical examination remained essentially negative. The temperature thus far during the entire hospital stay had remained consistently elevated. The pulse in general was slow for the height of the fever.

On October 18 the abdominal pain seemed to have become particularly intense. At that time a Widal reaction was reported as positive. The following day muscle spasm was noted in the right upper quadrant. A diagnosis of acute cholecystitis was made and operation was considered necessary. The white cell count, which had varied from 7,000 to 10,200 until October 8, rose to 15,400 on October 17 and to 23,000 on October 19. At operation an acutely distended gallbladder was found, with thickened and edematous walls. The gallbladder was drained. E. typhosa was cultured from the bile recovered from the gallbladder at the time of operation and on several occasions from the stools. The temperature gradually subsided during the week following operation. There was profuse drainage of bile through the operative wound. The patient was discharged from the hospital on Jan. 14, 1939.

Bile continued to drain through a persistent sinus at the operative site. The diagnosis was typhoid fever, acute typhoid cholecystitis.

Following operation, the stool cultures and drainage from the biliary fistula were consistently positive for E. typhosa. When this condition persisted for several months it was obvious that the patient had become a chronic typhoid carrier. In August 1939, approximately eleven months subsequent to the onset of her illness, cholecystectomy was performed to relieve the carrier state. At operation the gallbladder was found "adherent to the abdominal wall beneath the sinus tract at the lower end of the previous incision. It was markedly dilated and thickened, and contained at least one stone." Culture of the bile at this time was again reported as positive for E. typhosa. Following cholecystectomy the typhoid bacilli rapidly disappeared from the stools. Release specimens submitted during an observation period of one year were consistently negative for E. typhosa. The carrier condition had been relieved.

COMMENT

In 3 of the 4 reported cases, the severity of the clinical picture was of such intensity as to warrant operative intervention. It is obvious that the risk of perforation justifies surgical measures in any case in which such an eventuality is at all likely.

It is noteworthy that 2 of these patients (2 and 3) underwent operation before the association with typhoid had been established. A nurse who had been attending patient 2 and who had frequently handled postoperative dressings came down with typhoid. The typhoid etiology of the source case was determined only by the epidemiologic investigation which was instituted when the nurse's infection was reported to the state health department. Patient 3 contracted typhoid during the course of a small epidemic. The presence of other cases of typhoid in the wards of the hospital to which she had been admitted for surgical treatment first called attention to a possible diagnosis of typhoid. Although A. H. (patient 4) had been diagnosed as having typhoid before operation, a student nurse who had been caring for her came down with the disease before this diagnosis had been made.

This series of cases is indicative of the risk which the undiagnosed case of typhoid may bring to bear on employees in medical and surgical wards in hospitals. Such incidents are particularly liable to occur in connection with cases of acute typhoid cholecystitis in which signs and symptoms of the acute gallbladder involvement are often so striking as to obscure the underlying disease. Furthermore, it has been observed [19] that hospital personnel may contract typhoid subsequent to contact with previously undiscovered typhoid carriers admitted to hospitals for operations on the gallbladder. Although the chronic cholecystitis associated with the typhoid carrier state has been definitely established as a clinical entity, this fact may be forgotten by the physician confronted with a case of chronic gallbladder disease. Hence attention must be given in all cases of both acute and chronic cholecystitis to the possibility that E. typhosa may be the causative agent.

It is of interest that 2 of the patients (3 and 4) became chronic typhoid carriers. The carrier state in both instances persisted until cure was brought about by cholecystectomy. There is a possibility that S. R. (patient 2) might also have become a carrier had cholecystectomy not been performed. Stool cultures submitted by R. S. (patient 1) have been positive five months subsequent to the onset of his illness. Garbat [20] reported that a large percentage of patients with typhoid complicated by acute cholecystitis tend to become permanent carriers. It is therefore doubly important that all patients with acute typhoid cholecystitis submit a sufficient number of release specimens in order to exclude the development of the carrier state. On the other hand, acute cholecystitis is not the only factor that predisposes toward acquiring the carrier state. Very few known carriers present a past history of typhoid complicated by acute cholecystitis.

Analysis of these cases reveals that in each instance the complicating acute cholecystitis was preceded by a period of unexplained fever. A similar interval of idiopathic hyperpyrexia antedating the acute cholecystitis is noted in many of the cases recorded in the literature. Hence a diagnosis of typhoid must be considered in any case of acute cholecystitis in which the history reveals that the onset of gallbladder symptoms was preceded by a period of unexplained fever without any other localizing signs.

Occasionally the acute cholecystitis may appear within a few days following the recovery from typhoid. These cases may be considered in the same category with those in which the gallbladder involvement occurs during the course of the underlying disease. However, as the interval between the typhoid and the onset of gallbladder symptoms is prolonged, it must be assumed that chronic inflammatory changes arise within the gallbladder. The pathologic condition in such cases becomes that of chronic rather than of acute cholecystitis. Chapuy [21] reported a case of acute typhoid cholecystitis unassociated with any illness which might have been regarded as typhoid. It must be borne in mind that approximately one third [22] of known typhoid carriers do not present a past history of typhoid. It would therefore be extremely difficult to prove that Chapuy's case was actually acute typhoid cholecystitis rather than the chronic cholecystitis of a typhoid carrier presenting an initial attack of gallbladder disease. The finding of gallstones at operation may in such cases assist in establishing a diagnosis of chronic cholecystitis. In the series of cases of chronic typhoid cholecystitis reported by Bigelow and Anderson [23] in 1933, gallstones were found in all. No stones were found in any one of our 3 cases of acute cholecystitis in which surgical treatment was undertaken. Similarly, those reporting in the literature rarely if ever mention the finding of gallstones at operation.

Consideration must be given to the protection of hospital personnel against chance contact with cases of unrecognized typhoid cholecystitis. Several procedures are available as safeguards for such persons. Patients with chronic cholecystitis presenting a past history of typhoid or any unexplained fever, no matter how long ago, should be placed on typhoid precautions until the carrier state has been excluded. In addition, great care must be exercised by persons handling dressings and discharges from all other patients with gallbladder disease. Cases of acute cholecystitis with a history of a preceding bout of unexplained fever should be investigated by suitable laboratory methods as probable cases of typhoid. Furthermore, routine antityphoid immuni-

19. Rubenstein, A. D.: Unrecognized Typhoid Cholecystitis as a Source of Hospital Infections, New England J. Med. **226:** 722-726 (April 30) 1942.

20. Garbat, A. L.: Typhoid Carriers and Typhoid Immunity, New York, Rockefeller Institute for Medical Research, 1922.

21. Chapuy, A.: Cholécystite éberthienne primitive sans fièvre typhoïde, Lyon méd. **153:** 313-315 (March 18) 1934.

22. Massachusetts Department of Public Health: Unpublished data.

23. Bigelow, G. H., and Anderson, G. W.: Cure of Typhoid Carriers, J. A. M. A. **101:** 348-352 (July 29) 1933.

zation of hospital personnel, including nurses, physicians and ward attendants, will mitigate considerably the risk of acquiring the disease as a result of contact with patients with undiagnosed typhoid or with unrecognized typhoid carriers. To maintain a proper level of immunity, the initial three doses of vaccine must be fortified by an annual stimulating dose of 0.5 cc. subcutaneously or 0.1 cc. intradermally.[24]

SUMMARY

Acute cholecystitis as a complication of typhoid may appear during the course of the disease or early in convalescence. Any case of acute cholecystitis in which the onset of gallbladder symptoms is preceded by a bout of unexplained fever should be studied as a possible case of typhoid.

Chronic cholecystitis is a frequent result of the localization of the typhoid bacillus in the gallbladder of typhoid carriers. Every patient with gallbladder disease who has a definite or suggestive history of typhoid should be placed on typhoid precautions until laboratory study excludes the carrier state.

These measures will prevent possible infection of hospital personnel from contact with patients with undiagnosed typhoid and with unrecognized typhoid carriers.

Routine immunization of hospital personnel against typhoid will also minimize this hazard.

Clinical Notes, Suggestions and New Instruments

AMPHETAMINE SULFATE POISONING IN A CHILD OF TWENTY MONTHS

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It seems trite to caution parents to keep drugs out of the reach of children.

The mother of a girl of 20 months was being treated with a 1 per cent amphetamine sulfate solution used as a nasal spray. There was no caution on the label that this might be toxic if taken internally.

At 3:30 p. m., before the parents realized what was happening, the child had worked off the top of the container and had drunk a quantity of the contents of the bottle. Early in the evening the child began to be increasingly restless, moving her arms and legs incessantly and crying out. She refused everything by mouth and vomited twice during the evening. I saw her at 11 p. m. and gave her 1½ grains (0.1 Gm.) of seconal rectally. After an hour the child slept thirty minutes and then wakened and continued her former extreme activity.

At 2 a. m. she was again given 1½ grains of seconal and after about forty minutes she slept until 6 a. m. and woke up as restless as before. When again seen at 9 a. m. her activity was extreme and there were signs of exhaustion with rapid pulse, pallor, rapid shallow respiration, hollow eyes and acetone breath. She was taken to the Children's Memorial Hospital and given 300 mg. of avertin with amylene hydrate and 300 cc. of 5 per cent dextrose and saline solution intravenously. The intravenous dextrose and saline solution was repeated early in the afternoon. At about 5 p. m. she woke up and seemed quite herself and made an uneventful recovery. She was sent home the following morning.

This report is written to call attention again to the importance of locking away from children all drugs and also to urge manufacturers to label products that can do harm.

5303 Lakewood Avenue.

24. Longfellow, D., and Luippold, G. F.: Typhoid Vaccine Studies: Revaccination and Duration of Immunity, Am. J. Pub. Health **30**: 1311-1317 (Nov.) 1940.

FATAL AORTIC-ESOPHAGEAL FISTULA FROM A SWALLOWED FISHBONE

REPORT OF A CASE AND REVIEW OF THE LITERATURE

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Reports have appeared of fatal hemorrhage resulting from a foreign body in the esophagus. The case presented here emphasizes the need for early esophagoscopy in cases in which a foreign body in the esophagus is suspected. Chevalier Jackson has stated "Esophagoscopy is demanded in every case in which a foreign body is known to be, or suspected to be, in the esophagus." To this dictum might be added only the word "early."

REPORT OF CASE

History.—C. S., a Negro girl aged 12 years, was admitted to the medical service of the Jersey City Medical Center on Jan. 16, 1939. She had excruciating pain in the lower sternal and left interscapular areas. The past history and family history contained nothing significant. The present illness began January 6, when, during a meal which included fried fish, the patient complained of a sticking sensation in the midsternal region. The pain increased in intensity but did not radiate. It lasted three days during which the patient felt worse on ingestion of anything except cold liquids. On swallowing, the patient localized the pain above the xiphoid cartilage. A physician was called and symptomatic treatment is said to have been given. At the end of the third day the pain disappeared, and swallowing again became normal until January 13, when the patient again began to complain of severe midsternal pain of a sticking character, this time radiating to the left interscapular region. The dysphagia returned and fever was noticed. Late January 13 the patient became nauseated and vomited about a cupful of dark red blood containing several clots. After this her stools were constantly tarry. The physician was called again and cold liquids, bed rest and opiates were ordered. The fever became higher and the pain so agonizing that hospitalization was ordered on January 16.

Examination.—On admission the temperature was 104.2 F., respiratory rate 32 and pulse rate 150 a minute and the blood pressure 120 systolic and 60 diastolic.

The patient was well nourished and well developed; she appeared acutely ill and was writhing about in severe pain. The skin was hot and dry. The organs of the head and neck presented no abnormality. There was no cervical rigidity. Except for sinus tachycardia, the heart was apparently normal. The lung fields were clear to percussion and auscultation. Hyperesthesia to light touch was present in the left interscapular region. Examination of the abdomen revealed slight deep epigastric tenderness and slight muscle spasm in the upper part of the abdomen. The organs were not palpable and there was no discernible fluid or distention. The hymen was intact. There was no vaginal discharge. The extremities were normal. Kernig's sign was not present. The deep reflexes were hyperactive and equal.

The urine showed a slight trace of albumin; otherwise it was normal. A blood count showed 4,800,000 red blood cells, 80 per cent hemoglobin (Sahli) and 17,800 white blood cells with polymorphonuclear neutrophils 84 per cent, lymphocytes 12 per cent and large mononuclears 4 per cent. A vaginal smear was negative for gonococci. Blood culture was sterile at five days. The Wassermann reaction was negative. X-ray examination of the chest revealed that the bony framework was normal. The trachea was in the median line. The heart shadow was within normal limits. Just below the clavicle at the arch of the aorta on the right there was a soft tissue shadow, which may have been from the aorta itself or from a mediastinal gland. The lung fields were normal. The hilar glands were moderately enlarged and there was some basal thickening of the pleura.

Diagnosis and Course.—The clinical impressions were perforation of the esophagus by a fish bone, mediastinitis and hemorrhage probably due to erosion of an esophageal vessel. We felt that esophagoscopy was contraindicated at the late date at which

the patient was seen by us. It was hoped that the mediastinal infection would localize and that the hemorrhage was sufficiently slow to arrest itself spontaneously. A conservative plan of therapy was therefore decided on. Pain was relieved with repeated small doses of morphine sulfate. Alcohol sponges were given and cold fluids were administered by mouth. The patient's condition remained unchanged except for a progressive rise of temperature to 105.2 F. and of the respiratory rate to 40 a minute. She died suddenly in her sleep thirty-two hours after admission. Postmortem examination was performed ten hours after death.

Autopsy.—Externally the body revealed no gross abnormalities except for extreme rigor mortis and moderate abdominal distention. The organs of the abdomen were in normal position but the liver edge was about 3 cm. below the costal margin. The stomach was greatly enlarged and through the visceral peritoneum the contents appeared definitely bluish. When the stomach was opened it was found to be filled with a tremendous clot of blood weighing 825 Gm. The mucosa of the stomach was well preserved and showed no abnormalities. The remainder of the gastrointestinal tract was considerably distended but section showed no pathologic changes and no evidence of a foreign body. The liver weighed 350 Gm. and appeared in all respects normal. The gallbladder was normal in appearance. The spleen, pancreas, adrenals and kidneys manifested both grossly and on section no evidence of disease. The pelvic organs were normal. On examination of the thorax the right pleura was found to contain no free fluid. The right lung weighed 350 Gm. There were numerous fairly free adhesions at the inferior pole of the lower lobe to the dome of the diaphragm. The tissue was air containing throughout, cut with ease and showed slight congestion at the base of the lower lobe. The left pleural cavity contained 50 cc. of yellow serous fluid. The left lung weighed 200 Gm. There were no pleural adhesions and the tissue was air containing throughout. The heart showed no abnormalities. The pericardial cavity, however, contained about 15 cc. of yellow cloudy fluid. Examination of the esophagus revealed in the posterior wall, at the level of the fifth thoracic vertebra, a round ulceration 1 cm. in diameter with thin margins. The lumen contained clotted blood. Posterior to the ulcerated area, in the areolar tissue between the esophagus and the aorta, there was a cavity 2 cm. in diameter containing blood and lined with soft, friable brownish tissue. This cavity became narrow as it approached the wall of the descending aorta and was found to be continuous with an opening communicating with the lumen of that vessel. The perforation in the aorta measured 4 by 3 mm. The edges of the rent were ragged and thin. Microscopic sections of that portion of the esophagus which was perforated revealed edema and congestion of the tissue. Around the perforation there were dense collections of polymorphonuclear cells. Evidence of a foreign body was not found and it was assumed that the foreign body was washed into the esophagus by the force of the current of blood from the aortic perforation.

REVIEW OF THE LITERATURE

Ginsburg [1] in 1931 reported that a man aged 26 swallowed a small denture which lodged in the esophagus at the level of the fifth dorsal vertebra and eroded the aorta, causing death a week later by hemorrhage into the esophagus and stomach. In this case esophagoscopy was not done until the patient collapsed, when of course it was too late. Dreiack [2] in 1934 mentioned among the other cases of his series that a man aged 49, without a history of having swallowed a foreign body, died five days after onset of symptoms. Autopsy revealed perforation of the upper part of the esophagus with erosion of the aorta by a splinter of bone. In this case the esophagus had also eroded into a principal bronchus. A fetid exudate was found in both pleural cavities. The esophageal defect was the size of a lentil.

Tucker [3] reported in 1932 that an infant aged 7 months who had previously been well suddenly became paler than usual, seemed to have difficulty in swallowing, developed fever and later vomited blood. X-ray examination revealed an open safety pin in the esophagus. After the patient had been removed to a hospital it was found that the pin had passed into the stomach. Later it was passed rectally, but the child died of exsanguination from a small perforation of the aorta via the esophagus. Autopsy further revealed an acute purulent pericarditis and minute embolic abscesses of the kidneys. The author emphasizes the importance of early x-ray examination of every child who experiences the slightest difficulty in swallowing.

Turner [4] in 1910 reported that a boy aged 6 years died of perforation of the aorta by a coin which he had swallowed twenty-two months before. This patient had had initial symptoms of a foreign body in the esophagus but these had disappeared and he was symptom free until he began to vomit blood three days before his death. At autopsy the coin was found impacted transversely at the level of the left bronchus. Turner reported 4 other cases of erosion or perforation of the aorta, 2 from rabbit bones and 2 from fish bones.

Lovett [5] in 1909 reported that a boy aged 8 years began suddenly to vomit blood and to pass tarry stools. He died of exsanguination in a few days. He had swallowed a half-penny coin at the age of 4 but had not had an x-ray examination. He was treated conservatively, and when he became symptom free the matter was forgotten until the terminal illness. The coin was recovered from the upper part of the esophagus at the postmortem examination. It had slowly eroded into the aorta, death occurring from hemorrhage through a hole the size of a pinhead.

The literature contains many reports of the perforation of vessels other than the aorta by foreign bodies in the esophagus. A typical one is that of Sneller,[6] who in 1936 reported a case of profuse arterial bleeding following perforation of the esophagus by a chicken bone. Ter-Oganesjan [7] reported 50 such perforations of great vessels and Killian [8] 12 more.

Swain [9] in 1930 reported a traumatic aortic-esophageal fistula in a 10 month old baby who swallowed a small piece of nickel plated wire. Decoulx and Omez [10] in 1939 reported that a man aged 41, a miner, suffered dysphagia after he swallowed a chicken bone and subsequently bled to death from an aortic-esophageal fistula following a crushing chest injury in the mine. The conclusion was that the esophageal ulceration from the bone predisposed to the final rupture and that the thoracic trauma precipitated it. The chicken bone was not found.

COMMENT

Death from mediastinitis, empyema, pyopericardium and erosion of great vessels has been reported from time to time in case reports dealing with foreign bodies in the esophagus. In cases in which there is erosion of vessels the great vessels of the neck are more commonly perforated, the great thoracic vessels and the heart less commonly. Perforation of the thoracic aorta by a foreign body in the esophagus, while not rare, is sufficiently uncommon to warrant being reported.

CONCLUSION

All patients suspected of having a foreign body lodged in the esophagus should be studied early by roentgenography and esophagoscopy. If symptoms persist despite negative x-ray findings, diagnostic esophagoscopy is demanded. Esophagoscopy itself is rarely responsible for a fatality and will often be life saving if undertaken early. Only by accurate history taking and prompt action in suspected cases is it possible to prevent a fatal issue in the type of case reported here.

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XANTHOMA OF TENDON SHEATH

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While xanthomas of tendon sheaths or of synovial membranes are not too rare, they are worthy of consideration because frequently they are known to perplex the unsuspecting physician. The following case illustrates the difficulties in the diagnosis and treatment of this condition. It is presented because, while it illustrates most of the essential features of this condition, it is one of the most extensive lesions yet recorded.

REPORT OF CASE

H. W., a white man aged 46, married, was first admitted to Dr. Gill's orthopedic service in the Hospital of the University of Pennsylvania on March 26, 1924 complaining of pain and swelling of the left foot. He stated that the pain started approximately three years before without any definitely known cause save the possibility of repeated minor injuries received while bowling. Pain was very slight at first and some swelling of the left foot and lower ankle was appreciated after six months. He consulted a physician, who prescribed arch supports after receiving a negative x-ray report. He got along fairly well with these but did experience ever increasing discomfort for the six months prior to admission to the hospital. The pain was never severe enough to prevent him from walking. On admission a moderate amount of swelling was present behind and below the medial malleolus and the inner side of the tarsus of the left foot, extending along the course of the tendon of the tibialis posticus muscle. On March 27, 1924, under ether anesthesia, five small tissue masses were removed from his left foot and they were diagnosed as "mixed cell sarcoma of alveolar arrangement with much degeneration and blood pigment." He returned on April 9, 1924, when another piece of tissue was removed. This was diagnosed as being "xanthomatous" and the patient was referred for x-ray therapy. An x-ray examination on Nov. 6, 1924 revealed no evidence of recurrence. He returned again on Feb. 19, 1925, at which time the following was recorded: "There is a soft doughy mass present in the region of the inner surface of the left foot in the same area as was occupied by tumor. This is suggestive of an extension or a recurrence of the original tumor. Recommend further x-ray treatment. Has had no x-ray treatment since October 1924." On June 26, 1928 examinations revealed no evidence of recurrence and the patient was discharged from the x-ray department. He returned on May 7, 1942, at which time a soft tumor measuring 2 by 3 inches over and below the left medial malleolus and definite soft tissue thickening of the entire foot on both the dorsal and the plantar aspect were observed. The skin appeared thin over the tumor but appeared normal about the foot. Pain and tenderness were absent and weight bearing was painless. Dr. Gill saw the patient and advised amputation because, while the lesion was probably not malignant, there was the possibility of its becoming so. The patient stated that he first noticed the presence of this swelling, or tumor, about three years previously in the region below the internal malleolus and that it had gradually grown in size and extended into the entire foot, but that during the past year the growth had been more rapid.

The history by systems was essentially negative with no history of weight loss. The family and social histories were noncontributory. Physical examination revealed that the temperature was 98 F., the pulse rate 70 and respiratory rate 20. The blood pressure was 156/72 mm. of mercury in both arms while recumbent. The patient was somewhat obese and though 63 years of age appeared to be about 50. He was ambulatory and in no distress. A small tender nonfixed nodule was observed over the left eyebrow measuring 1 by 5 cm. A soft apical blowing systolic cardiac murmur was heard. The left foot appeared as described. Laboratory examination revealed hemoglobin 88 per cent, white blood cells 5,100 with a normal differential, negative blood Wassermann reaction, normal blood calcium, phosphorus and phosphatase and normal urine. X-ray examination of the left leg and foot on May 12, 1942 revealed erosive bone changes in the left ankle and foot suggesting extensive pressure. On May 14, using ether anesthesia, Dr. Gill incised the mass on the medial aspect of the left foot and found that it contained yellowish necrotic material. This extended throughout all the enlarged parts of the foot. It was fairly vascular. A specimen was sent to the laboratory. Removal of the tumor tissue was impossible, as it extended into all the soft structures of the foot. Amputation was done at the junction of the middle and upper thirds of the leg. No difficulties were encountered. The patient was returned to the ward in good condition and was given parenteral fluids. The amputated left foot (upper tibial amputation) was increased in size with tissue tense and bulging, especially around the inner aspect. Subcutaneous tissues down to the bone were filled with bundles and lobules of orange yellow soft tissue. The tissue was stained with dark blood in many areas. Process completely surrounded the thinned metatarsals without invasion. Microscopic examination revealed foam cells (xanthoma cells) containing intracellular fat and cholesterol crystals, cholesterol clefts, foreign body giant cells, typical endothelium-like stroma cells and interlacing strands of fibrous tissue. The diagnosis was xanthoma of the tendon sheath.

Fig. 1.—Section of foot illustrating most likely origin of tumor. Section made by band saw after two hours' fixation with solidified carbon dioxide. Specimen allowed to thaw out in Klotz solution number 1.

Microscopic study prompted estimation of the patient's blood cholesterol, which was found to be 276 mg. per hundred cubic centimeters with esters 181 mg. per hundred cubic centimeters. The patient's postoperative course was entirely uneventful and he was discharged two weeks later.

COMMENT

A clinical and pathologic study of this problem was published by Galloway, Broders and Ghormley [1] in 1940. They reviewed the literature and added 70 cases. Their investigations showed that these are slowly growing painless tumors averaging approximately five years to develop before they are discovered. While the tumor varies in size and shape, it aver-

Dr. Cristol, formerly a member of the Department of Pathology of the University of Pennsylvania Medical School and Hospital, is now urologic fellow at the Mayo Clinic. Dr. Gill is professor of orthopedics of the University of Pennsylvania Medical School and Hosptal.

1. Galloway, J. D. B.; Broders, A. C., and Ghormley, R. K.: Xanthoma of Tendon Sheaths and Synovial Membranes: A Clinical and Pathologic Study, Arch. Surg. **40**: 485-538 (March) 1940.

ages 2.5 to 3.0 by 2.0 cm. when first seen by the physician and in most cases is a firm, round or oval lesion. Galloway and his collaborators found that these lesions occurred most commonly on the fingers, and on the upper extremity two to three times as often as on the lower extremity. They found that the largest number of cases fell in the third to sixth decades,

Fig. 2.—Microscopic section of tumor demonstrating cholesterol clefts above separated by fibrous septums from foam cells below; × 200.

the average age in their cases being 44 years. The two sexes were found to be about evenly involved with a very slight female preponderance. It was felt that principally trauma of a mild, constant and unnoticeable type, and possibly infection were important secondary factors in the production of these tumors. They concluded that the alteration in lipoid metabolism was the primary etiologic factor, with trauma and infection or both being a secondary factor. In a review of the pathologic picture it was believed that the foam cell originated from the reticuloendothelial system and its contained cholesterol was present via infiltration. It was also believed that the giant cells, which along with the foam cells are characteristic elements of this tumor, were morphologically identical with osteoclasts and differed from them only in their affinity for different foreign materials. The contained pigment is believed by some to result from the breaking up of the red blood corpuscles of the extravasated blood in the tissues or, as Wells believes, from the presence of either carotene or xanthophyll pigments or both, which are normally present in the blood serum and are readily taken up and combined with cholesterol fatty acid esters. These mentioned elements, together with the type cell, complete the diagnostic pathologic picture. The type or stroma cell is morphologically similar to the endothelial cell and its fat content is made up chiefly of cholesterol or of its esters, being intracellularly arranged in most cases.

Concerning the pathogenesis, the authors mentioned believe that "the primary factor in production of this tumor is a pre-existing alteration in the lipoid metabolism in which there is either a marked disturbance in the absolute values of the blood lipoids, or even more important, a disturbance in the ratios of the various constituents, chiefly that of cholesterol to esters, and that the secondary factor is trauma or infection at the site of the lesion."

Most authors regard these lesions as benign and many also point out their potential malignant nature, especially in those occurring in the palm of the hand, forearm or foot. Many authors believe that these tumors are of inflammatory origin. Some authors believe them to be inflammatory with a secondary disturbance in lipoid metabolism, while others believe that they are only associated with a cholesterol diathesis and result from the removal of the excess cholesterol from the blood. Galloway and his collaborators believe that these tumors should be classified as one of the primary essential xanthomatoses and agree with the classification of Thannhauser and Magendantz.[2]

In the diagnosis we could describe a typical case as occurring in either sex around 40 years of age with a firm, round or oval subcutaneous mass measuring approximately 2 to 3 by 2 cm., painlessly growing in size and located on or associated with a tendon sheath, most typically the flexor of a finger. The most characteristic case will present a history of previous trauma and the blood lipoids will demonstrate an absolute increase or an alteration in the ratio of cholesterol to cholesterol esters. The x-ray examination will prove normal. In joint involvement there may or may not be heat and pain, and examination of the aspirated joint fluid will reveal a high cholesterol content. These tumors are harder than lipomas and softer than chondromas. Unlike carcinoma, they do not involve the skin. Osteomas are harder and are connected with the bone, while ganglions are usually on the extensor surface, besides being much softer. Biopsy and surgical removal will always reveal the true diagnosis. Local excision, even if repeated with recurrence, is the choice method of treatment.

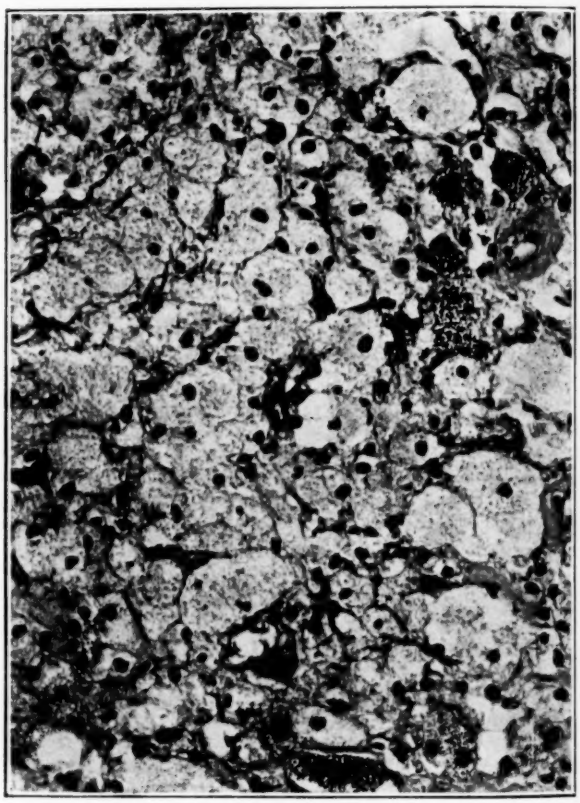

Fig. 3.—Microscopic section of tumor showing pigment content of foam cells, with some typical endothelium-like cells of the stroma; × 400.

The value of x-ray therapy is still to be more critically evaluated, but some authors have reported good results. Low cholesterol diets are prescribed for patients who show high blood values.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

HANOVIA SAFE-T-AIRE FILTER JACKET TYPE QUARTZ LAMPS
(Hospital Operating Room, Nursery and Ward Models)
ACCEPTABLE

Manufacturer: Hanovia Chemical & Mfg. Co., Newark, N. J.

Clinical evidence submitted to the Council on Physical Therapy shows that under properly controlled conditions ultraviolet radiation is effective in killing air borne micro-organisms and may be used to supplement other measures for the prevention of cross infection in hospital wards and nurseries and in operating rooms for reduction of air borne infections in wounds. On the basis of this evidence the Council has undertaken the consideration of ultraviolet disinfecting lamps designed for installation in operating rooms, hospital nurseries and hospital wards. Council acceptance is limited to these installations only because the available data do not substantiate the claims for disinfecting of air by ultraviolet radiation in schools, waiting rooms, public gathering places and homes or for the sterilization of solids such as drinking cups. Ultraviolet radiation cannot penetrate deeply and may be absorbed by finger marks, saliva, cosmetics or other foreign matter on a drinking cup; this would render the radiation ineffective. To kill a micro-organism a direct hit by ultraviolet rays of sufficient intensity is required.

To have effective disinfection of air by ultraviolet radiation, it is necessary for a sufficient number of properly placed lamps to be installed. A lamp used for disinfecting purposes is a single unit in an installation; compliance of the ultraviolet output of a single lamp unit with the Council's requirements does not insure adequate radiant disinfection. Adequate ventilation is a necessity because dust laden air provides protection for air borne micro-organisms against the ultraviolet radiation.

In an installation of ultraviolet disinfecting units, the total amount of direct and scattered ultraviolet radiation incident on the occupants must be kept below the level that will produce conjunctivitis, erythema and any other (at present unforeseen) injurious physiologic effects that may arise from prolonged irradiation. This requirement should be met by suitable arrangements of the lamp fixtures and baffles and not by requiring the personnel to wear glasses and special covering of exposed parts of the body (face, hands) normally uncovered. Hence, if the irradiation is of penetrating intensity, in a corridor of the hospital, for example, care should be taken that the attendants do not receive an exposure which will cause injury to the skin or eyes and particular attention should be taken to make sure that the intensity of the space at eye level through which a transient may pass or tarry momentarily will not cause injury to the eyes. Under no circumstances should the occupants of a room be able to look directly at the burner when standing within the region of potent intensity.

Ultraviolet lamps for disinfecting purposes shall have under suitable ventilating conditions of a room a concentration of ozone not to exceed one part in ten million.

The Hanovia Safe-T-Aire Quartz Lamps, Filter Jacket Type, generate ultraviolet radiation of wavelengths between 2,500 and 2,600 angstroms and are said in the firm's literature to ". . . furnish air sanitation and by this means to lessen the danger of infection through air borne organisms." The lamps are available in ceiling suspension models, wall type equipment, operating room models and floor stand models and the Baryaire Safe-T-Air equipment.

Evidence consisting of reports from several investigators having used in their experiments the Safe-T-Aire burners and other lamps said to have disinfecting properties was presented by the firm. That ultraviolet radiation from the Safe-T-Aire will destroy bacteria within a specified distance and under required conditions is substantiated in the evidence submitted.

The ceiling suspension lamp comprises an indirect lighting fixture suspended by three chains to a height of about 6 to 7 feet from the floor at its lowest point. The burner housing is bowl shaped and of polished aluminum and is about 20½ inches in diameter. A polished reflector is mounted in the housing.

Wall type Safe-T-Aire equipment is designed to be mounted on the side wall of a room at a point where the radiations will cover the largest area.

The operating room model is arranged for ceiling or wall mounting. It is usually fixed on the wall at ceiling height or at a distance usually not greater than 14 feet from the floor.

The floor stand unit is said to be ". . . designed to fill the need for a portable unit which can be moved at will. The general design of the lamp is similar to an indirect illuminating lamp." The upright finished in polished chromium supports the burner above eye level.

The Baryaire Safe-T-Aire equipment is usually installed in pairs at opposite points across the width of a hospital corridor, to help prevent the passage of air borne micro-organisms. Approximately 24 inches square and 9 inches deep, the unit is equipped with a fan which draws air past the upper and lower burners.

The Safe-T-Aire burner which is incorporated in each of the fixtures mentioned is tubular; standard sizes are 12 and 24 inches long. The envelop of the burner is of pure transparent fused quartz; cathode connections are sealed in the quartz tube without the use of intermediate glass. The tube operates from alternating current through the medium of a high voltage transformer with a primary supply voltage of 110 or 220 volts. A filter jacket is provided to limit the production of ozone.

Technical Information for Quartz Safe-T-Aire Lamp Water Jacket Types

Specification	Catalogue No. 2851-J Filter	Catalogue No. 2852-J Filter
Effective burner length	12 inches	24 inches
Overall burner length	16⅛ inches	29¼ inches
Operating control		
Supply input voltage	110/120 volts	110/120 volts
Supply frequency	60 cycles AC	60 cycles AC
Lamp circuit		
No load voltage	3,000 volts	3,000 volts
Burner operating voltage	450 volts	600 volts
Burner watts	7	10
Burner current	30 milliamperes	30 milliamperes
Supply input current	1.25 amperes	1.20 amperes
Power factor	0.19	0.21
Supply watts	26 (at 115 V)	29 (at 115 V)
Lamp radiation characteristics		
% ultraviolet at 2,537 angstroms	96%	96%
Intensity of 2,537 angstroms for new lamp with clean reflector of Alzak aluminum, distance 1 meter (line voltage 118 volts)	22 mw/cm²	48 mw/cm²
Effective burner life	over 10,000 hrs.	over 10,000 hrs.
Percentage loss in effectiveness with usage:		
After the first 1,000 hours	5% loss	
After the next 2,000 hours	7% additional	
After the next 5,000 hours	5% additional	
After the next 5,000 hours	2% additional	
Total loss in effectiveness in 1,000 hours	19%	

Users of the lamps are advised to have the intensity checked at periodic intervals by company representatives or other qualified persons. After ten thousand hours of use the intensity or effectiveness of the Hanovia burner falls off more rapidly and it should be replaced after it has been used ten thousand to fifteen thousand hours.

These lamps are a very intense source of 2,537 angstroms ultraviolet radiation. The eyes must be carefully protected from direct radiation from the lamp.

When a unit is installed, the purchaser should make sure that a sufficient number of lamps are used to produce the correct amount of intensity in the enclosure and that they are arranged correctly so as not to cause harm to the occupants. The Council cannot undertake the supervision or assume the responsibility for satisfactory performance of any particular installation.

The Council voted to accept the Hanovia Safe-T-Aire Filter Jacket Type Quartz Lamps, Operating Room, Ward and Nursery Models, for inclusion on its list of accepted devices. Models which are unequipped with the filter jackets to prevent the production of ozone are not acceptable for disinfection purposes.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, AUGUST 7, 1943

MORE DOCTORS NEEDED FOR THE ARMED FORCES

At a conference of the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, held on July 31 with the War Participation Committee of the American Medical Association and in the presence of Mr. Paul V. McNutt, chairman of the War Manpower Commission, and representatives of the Army and Navy medical departments and the Public Health Service, it became apparent that the medical profession must produce toward the winning of the war an additional six thousand physicians for the armed forces before Jan. 1, 1944. Pursuant to a realization of this objective a directive has gone to the generals in command of the various service commands authorizing them to induct into the service physicians between the ages of 38 and 45 who have been declared available by the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians and who are otherwise subject to Selective Service.

6,000 MORE PHYSICIANS NEEDED NOW!

The needs of the armed forces are real. The members of the War Participation Committee raised with the representatives of the various governmental agencies all the questions that have from time to time challenged the need; the challenge seems to have been met effectively. Indeed, the intimation was made clear that the needs of the armed forces will be met by specific regulations of the Selective Service Administration or the enactment of necessary legislation if required. All physicians up to 45 years of age who have been indicated as available have therefore placed on them now the responsibility for an immediate decision as to their enlistment with the armed forces. The need is so positive that questions of essentiality of men in positions of teaching and research and in industrial medicine are likely to be rigidly reviewed in the near future with a view to extracting from civilian life every one that can be spared.

As the war continues and intensifies, new needs for the services of the medical profession become apparent. An army in motion and one engaged in the kind of aggressive combat that now concerns our armed forces needs physicians in even greater numbers than have heretofore been demanded. Many thousands of interned aliens and prisoners are now the burden of the United States and must be given medical care.

If there is any physician who still hesitates under these circumstances, he should realize the added advantage to him of accepting now the commission that is proffered. Should it become necessary in the near future, as seems quite likely, to enlist new activity by the Selective Service Administration and the Officers' Procurement Service to bring in the six thousand physicians that are so certainly required, those recruited by that technic will inevitably begin their service with the minimum commission that is offered, namely that of first lieutenant. Until that technic is installed, the men of special competence and of years beyond those of the recent graduate have the assurance of careful consideration and a commission more nearly in accord with age and experience.

The call here made has the approval of the Directing Board of the Procurement and Assignment Service and of the War Participation Committee of the American Medical Association. The medical profession may well be proud of the fact that it has been the only group given, by directive of the President, the responsibility of maintaining service in civilian life and at the same time supplying the needs of the armed forces. Let us not fail in meeting fully the trust that has been placed upon us.

HYPERADHESIVE THROMBOCYTES

A rise in blood platelet count following childbirth or surgical operation is a well established clinical phenomenon and is believed to be a contributory factor in postoperative or postpartum venous thrombosis. This rise begins about the fourth day after operation or delivery and attains its maximum about the tenth day, the number of circulating platelets subsequently falling to the normal by the twenty-first day. The period of hyperthrombocytemia corresponds roughly with the period in which venous thrombosis generally occurs. The correspondence, however, is not complete. To account for this divergence, MacKay [1] postulated a second thrombogenic factor, an increased agglutinability or adhesiveness of blood platelets.

A technical method of measuring relative platelet "stickiness," therefore, was developed by Wright [2] of Guy's Hospital, London. After addition of an anticoagulant, blood samples are revolved slowly in glass tubes, the rate of decrease in the platelet count being taken as a measure of the number of thrombocytes that became adherent to the glass surface. In normal blood samples about 33 per cent of the initial platelets became adherent after twenty minutes' rotation, increasing to 67 per cent by the end of eighty minutes.

This technic has now been applied to a series of obstetric and surgical cases.[3] By the fourth day after operation or delivery a distinct increase of adhesiveness was noted, increasing to a maximum "stickiness" by the tenth day. At this time an average of nearly 90 per cent of the platelets became adherent to the glass surface in their routine test. After the tenth day the stickiness gradually decreased, the platelets being restored to normal by the twenty-first day. In paraffined control tubes practically no platelets become adherent.

Plotted as a curve, this increased "stickiness" shows a closer parallelism with the percentage incidence of thrombophlebitis [4] than that shown by the increased platelet count. Wright concluded from this that the presence of "exceptionally sticky platelets" is the essential etiologic factor in postoperative and postpartum thrombosis.

Parallel studies of sedimentation rates indicated that this increased adhesiveness is not due to plasma changes but must be attributed to alterations in the platelets themselves. Wright therefore postulates that new formed blood platelets are hyperadhesive and that there is a progressive reduction in their initial stickiness as the platelets age. Whether or not excessive formation of these hyperadhesive platelets can be prevented by blood transfusion or other therapeutic measures has not yet been determined.

1. MacKay, William: Quart. J. Med. **24:** 285 (April) 1931.
2. Wright, H. P.: J. Path. & Bact. **53:** 255 (Sept.) 1941.
3. Wright, H. P.: J. Path. & Bact. **54:** 461 (Oct.) 1942.
4. Barker, N. W.; Nygaard, K. K.; Walters, Waltman, and Priestley, J. T.: Proc. Staff Meet., Mayo Clin. **16:** 17 (Jan. 8) 1941.

Current Comment

BOSTON MEDICAL POLICE

In 1808 the Boston Medical Association adopted a code of Medical Police [1] which its standing committee had been instructed to prepare. This code was based on the ethical teachings of Gregory, Rush and Percival, with changes and additional matter to meet better the conditions in Boston at that time. The subjects covered are consultations, interferences, differences of physicians, discouragement of quackery, conduct for the support of the medical character, fees, exemption from charges, vicarious offices and seniority. Physicians in consultation "should divest themselves of all partialities and think of nothing but what will most effectively contribute to the relief of those under their care." By "interferences" is meant meddling inquiries and hints or other selfish conduct of any kind by physicians that might tend to weaken the confidence of the patient in his physician. The practice of medicine should be founded on qualification, not on artifice and insinuation. The section on quackery follows:

> "The use of quack medicines should be discouraged by the faculty, as disgraceful to the profession, injurious to health, and often destructive even of life. No physician or surgeon, therefore, should dispense a secret nostrum, whether it be his invention or exclusive property; for if it is of real efficacy, the concealment of it is inconsistent with beneficence and professional liberality; and, if mystery alone give it value and importance, such craft implies either disgraceful ignorance, or fraudulent avarice."

Under fees we read that "the poor of every description should be the objects of our special care." Clergymen and all members of the medical profession together with their families should be attended gratuitously. In June 1830 revised rules and regulations were adopted by the association and printed, together with the Medical Police and a list of members.[1] The rules provided for the conduct of the business of the association as well as of medical practice. A detailed table of "regular fees" is included. Here are samples: The common fee for a visit, $1.50; for advice at the physician's house, according to the importance of the case and the time occupied, $1 to $10; for a postmortem examination in a case of legal investigation, $5; for vaccine inoculation, $5; for capital operations, such as amputations of large limbs, lithotomy, trepanning and extirpation of large tumors, $40. With certain exceptions, the fees listed were the lowest the members should demand. Members were not allowed to contract to give annual service to any family for a definite sum. According to paragraph VI, no member should "consult with, or voluntarily meet in a profesional way, or aid or abet any practitioner resident in this town, who is not a member of the association." One wonders how this rule worked out in practice. Full provision was made for the admission of new members on the basis of approval of these regulations. From its foundation in 1806 to July 1830 the association had 170 members. This

1. Boston Medical Police: Rules and Regulations of the Boston Medical Association, Boston, Press of J. H. Eastburn, 1830.

glimpse at medical organization in the beginning of the last century reveals the high ideals that governed Boston physicians of that day in their strivings to maintain and advance the ethics of the practice of medicine.

SYNTHESIS OF BIOTIN

Biotin, a factor in the B complex, is of unusual interest. It is involved in animal metabolism and also is capable of exerting a noticeable biologic effect, under appropriate test conditions, in a dilution of one to four hundred billion,[1] thus ranking as one of the most active substances known. A comment on the determination of the structure of this potent compound by du Vigneaud and his collaborators was published some months ago in THE JOURNAL.[2] At that time it was pointed out that the elucidation of the chemical makeup of the vitamin was an initial step in the direction of making it more readily available through synthesis. This synthesis was not long in forthcoming, for the preparation of synthetic biotin has now been reported.[3] The material possesses a complex chemical structure and includes in its makeup three different asymmetrical carbon atoms. The latter fact makes possible the existence of several stereochemical isomers related to biotin. Snythesis of a product possessing not only the structure but also the stereochemical configuration of natural biotin was an accomplishment of the first magnitude. A comparison of the physical and chemical properties of the synthetic product with those of naturally occurring material revealed no difference between the two substances. The crucial test was a comparison of the biologic activity of the two chemical compounds as determined by experiments with biotin deficient chicks and rats. The physiologic response of biotin deficient animals to the synthetic product was the same as to the naturally occurring biotin. The way has thus been cleared for the production of amounts of biotin which will greatly facilitate the carrying out of experiments designed to increase our knowledge of this member of the vitamin B complex. Kögl and Tönnis,[1] who isolated biotin for the first time, were able to obtain only 1 mg. of the crystalline material from a quarter of a ton of dried egg yolk.

DOMESTIC CARBON MONOXIDE POISONING

A report [1] has been published on the results of a cooperative study of the effects of carbon monoxide on the health of persons more or less habitually exposed to smaller and larger quantities of the gas in the air they breathe. This study was carried out by a committee under the joint auspices of the University, the State Board of Health and the Geological Survey of West Virginia in conjunction with a number of gas companies. In this study special attention was given to the effects of carbon monoxide on health under domestic conditions. The engineering survey revealed that in many homes one or more gas appliances discharged carbon monoxide into the rooms, some of them in large quantities. The clinical studies in general confirmed the description by Henderson [2] of the effect of repeated exposures to small amounts of carbon monoxide "such as a mechanic in an automobile repair shop breathes day after day, or a workman at a blast furnace or gas plant, or a cook working in a small badly ventilated kitchen with a defective gas stove. The results of such conditions are impairment of general health, nervousness, ill temper" and other general symptoms. The West Virginia investigators report that the symptoms will vary in intensity, depending on the quantity of monoxide in the air breathed, the length of exposure, the amount of monoxide in the blood, the activity and previous condition of the patient and other factors. In a field survey of the health and living conditions of 279 persons who lived at home or worked in shops in which natural gas was consumed for cooking or heating, 137 gave histories suggestive of carbon monoxide anoxemia, mostly of a simple and uncomplicated form. The diagnosis in these cases was based mainly on definite exposure to the monoxide gas, on subsidence of symptoms when the exposure ceased, on the presence of monoxide in the blood whenever it was possible to make the necessary tests, and on exclusion of other diseases. It is to be noted that these milder forms of monoxide poisoning do not present any distinctive clinical picture, the manifestations being essentially subjective. In suspected cases the definitive diagnosis will require proper chemical examinations of the blood of the patient as well as of the air he has been breathing.

STABILITY OF VITAMINS AND WHISKY

Present government regulations make it illegal to add vitamins to alcoholic beverages. Nevertheless, the fact that many of the diseases associated with chronic alcoholism are due primarily to deficiencies in the vitamin intake of the excessive drinker make information on the stability of vitamins in whisky of more than academic interest. Novak and Adams [1] investigated this question by fortifying a standard brand of 86.8-proof whisky with riboflavin, thiamine and nicotinic acid. Part of the whisky was exposed to daylight in clear bottles and part in amber bottles, and a control portion was stored in the dark. The result of the assays showed that riboflavin is unstable in whisky, since a reduction of 50 per cent of the amount added occurred in both paper-wrapped and amber bottles at the end of the two month period. At the end of six months assays indicated that loss of thiamine or nicotinic acid had not occurred and that these members of the vitamin B complex appear to be stable in whisky. Even if it should become legal to add vitamins to alcoholic beverages, physiologic considerations would incline to make such formulas undesirable.

1. Kögl, F., and Tönnis, B.: Ueber das Bios-Problem, Ztschr. f. physiol. Chem. **242**: 43, 1936.
2. Structure of Biotin, Current Comment, J. A. M. A. **121**: 54 (Jan. 2) 1943.
3. Harris, S. A.; Wolf, D. E.; Mozingo, Ralph, and Folkers, Karl: Synthetic Biotin, Science **97**: 447 (May 14) 1943.

1. Beck, H. G.; Roetman, E. T., and Suter, G. M.: Combustion Products Study, West Virginia University Bulletin, Series 43, No. 2-I (Aug.) 1942.

2. Henderson, Yandell: The Dangers of Carbon Monoxide Poisoning and Measures to Lessen These Dangers, Report 1 of the Committee on Poisonous Gases of the American Medical Association, J. A. M. A. **94**: 179 (Jan. 18) 1930.

1. Novak, A. F., and Adams, S. L.: Determination of the Stability of Thiamine, Nicotinic Acid and Riboflavin in Whisky Over a Six Month Period, Quart. J. Studies Alcohol **3**: 541 (March) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

LIEUT. COL. LEON S. EAGLEBERGER TO INSTRUCT PHYSICIANS IN COMBAT MEDICINE

Lieut. Col. Leon S. Eagleberger of the Army Medical Corps, with a great wealth of experience concerning medical support of United States troops battling the Japanese in the Southwest Pacific, has returned to the United States to instruct newly commissioned officers in combat medicine at the Medical Field Service School, Carlisle Barracks, Pennsylvania. Colonel Eagleberger states that the portable hospitals in which doctors performed surgery in the jungle only a few hundred yards behind the front lines were the 100 per cent solution to the problem of giving adequate surgical service in that area. Blood plasma, which was available in sufficient quantities, was used unsparingly, thereby saving many lives. The portable hospitals consisted of four medical officers and twenty enlisted men, with one such hospital for each regiment. Every general hospital, station hospital, evacuation hospital and surgical hospital in Australia had been ordered to organize one such unit.

Colonel Eagleberger, whose home town is Waupun, Wis., graduated from Rush Medical College in 1930. He was called into federal army service in January 1941 and spent eight months in New Guinea from the start of the United Nations operations there until April of this year. He commanded a battalion of a medical regiment. In May 1942 he was ordered to take part of his battalion to Port Moresby to establish a provisional hospital and to pave the way for the larger hospitals which would later move into that area.

LIEUTENANT COLONEL BUNSHAW CITED

Lieut. Col. Raymond H. Bunshaw, A. U. S., whose home is in Erie, Pa., has been cited for especially meritorious conduct in the performance of his duties on Guadalcanal, where he is still serving. According to the Erie, Pa., *Times* the citation reads as follows:

". . . for exceptionally meritorious conduct in the performance of services of a considerable degree of merit on Guadalcanal, Solomon Islands, from Jan. 10 to Feb. 9, 1943. As commanding officer of a medical battalion in an infantry division of which he was also division surgeon, Lieutenant Colonel Bunshaw succeeded in arranging the evacuation of casualties of the division in spite of the handicaps of extremely difficult terrain, lack of roads and the isolated positions of many units.

"This he accomplished by displaying outstanding initiatives, energy and by developing many improvisations and innovations in procedure to overcome the local conditions. His professional knowledge was employed and proved in the successful execution of the difficult task of the hospitalization by his battalion of twice the number of patients it was equipped to care for."

SELECTION OF PREMEDICAL STUDENTS

In compliance with recent army regulations, Indiana University School of Medicine has announced the selection of 154 premedical students for entrance to the school in May 1944. The selections were made by a committee of fourteen faculty members and practicing physicians, with Dr. C. H. McCaskey of Indianapolis as chairman, and are subject to maintenance by the students of satisfactory grades and conduct. On account of this provision the total of 154 selected is 16 per cent above the quota of the school. The premedical students selected are enrolled for premedical study in Indiana University and twenty-three other colleges and universities; among the selectees are nine women.

GRADUATE MEDICAL ADMINISTRATIVE OFFICERS

The nineteenth class of the Camp Barkeley Medical Administrative Corps Officer Candidate School graduated on July 7 following a special course of twelve weeks, which now has been lengthened to sixteen weeks. These former noncommissioned officers studied problems of supply, personnel, training and evacuation and as officers in the medical administrative corps will take over such duties in hospitals, camps and elsewhere, thus relieving medical officers to apply their professional skill to the treatment of the sick and wounded. The graduation address was delivered by Hon. Jesse E. Martin, state senator from Fort Worth, who was introduced by the school commandant, Brig. Gen. Roy C. Heflebower.

NINTH CLASS OF AVIATION PHYSIOLOGISTS

Graduation exercises at the School of Aviation Medicine, Randolph Field, Texas, for the ninth class of Aviation Physiologists was held on July 10. The course in aviation physiology is of five weeks' duration. Among those graduating were the following officers of the medical corps:

Capt. Fred Duimstra, Sioux Falls, S. D.
Capt. Herbert D. Krieger, Beverly Hills, Calif.
Capt. John R. Orndorff, River Forest, Ill.
1st Lieut. Seaburt Goodman, Cleveland.
1st Lieut. Harold L. Graber, Topeka, Kan.
1st Lieut. George A. Hallenbeck, Rochester, Minn.
1st Lieut. Vincent J. Palmeri, Newark, N. Y.
1st Lieut. Bradford D. Rodgers, Deming, N. M.
1st Lieut. Sidney I. Smith, Sheridan, Ill.
1st Lieut. Oliver H. Straus, Boston.
1st Lieut. Orville O. Witherbee, Santa Ana, Calif.

THE TORNEY GENERAL HOSPITAL

The Torney General Hospital has been established at the El Mirador Hotel in Palm Springs, Calif., following the purchase of that hotel by the government. By August of 1942 there were facilities for 500 patients and it is planned that on completion there will be 1,600 patient beds available. The hospital was named after Brig. Gen. George Henry Torney, Surgeon General of the Army from 1909 to 1913, during whose term of office inoculation against typhoid was started in the army.

The commanding officer at Torney General Hospital is Col. Augustus B. Jones, a distinguished internist. Major Edward T. Thompson of Milwaukee is executive officer. Col. Maurice A. Selinger is chief of the medical service from Washington, D. C.; Lieut. Col. William C. Sheehan, chief of the surgical service, from Philadelphia; Major Hans F. Smetana, chief of the laboratory service, from New York; Major Willard L. Nielsen, chief of the dental service; Major William A. Runkle, from Memphis, Tenn., chief of the x-ray service, and Major Julian N. Dow, chief of the eye, ear, nose and throat services, formerly of Los Angeles.

NAVY

ARMY-NAVY HOSPITALIZATION

According to the Bureau of Medicine and Surgery, in an agreement reached between the Army and Navy, all charges for the care of personnel in each other's medical facilities will be discontinued. Heretofore when army personnel were treated in naval facilities the War Department was billed, which was reversed when navy personnel received treatment in Army facilities. In the future, members of the armed forces may be treated in Army and Navy facilities without reciprocal billing.

LIEUT. THIRL E. JARRETT AWARDED SILVER STAR MEDAL

Lieut. Thirl E. Jarrett, MC, U.S.N., has been awarded the Silver Star Medal for conspicuous gallantry and intrepidity while serving as a medical officer at the Division Field Hospital during action against enemy Japanese forces on Guadalcanal in October 1942. On repeated occasions, while the hospital was under tremendous bombardment by hostile warships, Lieutenant Jarrett, with utter disregard for his own personal safety, worked tirelessly over his wounded comrades, administering plasma, rendering first aid and performing invaluable medical service under difficult and dangerous conditions. By his calm professional skill and loyal devotion, maintained above and beyond the call of duty, he undoubtedly saved the lives of many men who otherwise might have perished. Lieutenant Jarrett graduated from the University of Oklahoma School of Medicine in 1936 and after his internship and residency was commissioned as a lieutenant (jg), MC-V(G), U.S.N.R., on May 1, 1941, was commissioned a lieutenant (jg) (MC), U.S.N., on Oct. 20, 1941 and commissioned a lieutenant (MC), U.S.N., on June 15, 1942. His home address is Brooklyn.

AWARDED LEGION OF MERIT

Comdr. Don S. Knowlton, MC-V (S), U.S.N.R., has been awarded the Legion of Merit for his brilliant leadership, which made possible evacuation and hospitalization of Guadalcanal wounded despite heavy Japanese air and surface craft fire. The citation reads as follows:

"For exceptionally meritorious conduct in the performance of the outstanding services to the government of the United States as executive officer of the First Medical Battalion during the seizure and occupation of Guadalcanal, Solomon Islands.

"Under extremely difficult and dangerous conditions, Commander Knowlton, by his untiring effort and skilful organizing ability, developed a high state of efficiency in the medical battalion, particularly at the division field hospital.

"The steadfast functioning of this unit as a principal evacuation and medical supply center of the division, in an area heavily bombarded by Japanese air and surface craft, is attributable to his brilliant leadership and excellent training of subordinate personnel."

Commander Knowlton graduated from Tufts College Medical School, Boston, in 1921. He entered military service, Nov. 5, 1940, and is now camp medical officer and commanding officer of the Medical Field Service School, Infantry Battalion, Camp Lejeune, New River, N. C.

CIVILIAN DEFENSE

ORGANIZATION PLAN FOR RESCUE SERVICE

Plans for the organization of the Rescue Service, which is responsible for the recovery of persons trapped under the structural débris of demolished buildings in the event of enemy action, were issued on June 24 by James M. Landis, director of the U. S. Office of Civilian Defense, in Operations Letter No. 133.

To guide the development of a trained Rescue Service in the United States Citizens Defense Corps, an engineer officer of the U. S. Public Health Service, Mr. Simon H. Ash, has been designated chief of the rescue section of the Medical Division of the OCD. Mr. Ash has recently returned from a month's visit to Britain, where he studied the British rescue organization and training methods.

Although the Rescue Service is being organized nationally under the direction of the Medical Division of OCD, state and local rescue services will be separate from the Emergency Medical Service. Local chiefs of rescue and emergency medical services will work in close coordination in the control center. When reports are received of persons trapped by the débris of buildings demolished by an air raid or other enemy action, an express party is dispatched, which consists of one rescue squad, one mobile medical team and one ambulance and one sitting-case car.

Rescue workers, who should be recruited from workers in the building and demolition trades, mine workers, mechanics, petroleum industry workers and tunnel workers in the heavy construction industry, are to be organized in squads of ten. The squads should be based in depots, each of which should have a complement of three squads rotating on periods of first call. The OCD recommends an average of one depot for each 50,000 population in target areas. The national program contemplates an establishment of about 1,000 depots and a full rescue personnel of 30,000 organized into 3,000 squads.

Training for rescue squads will include special technical instruction and drill ranging over all classes of rescue problems and, in addition, practice in advanced first aid and handling of the injured. The medical division now has in press two publications, "Technical Manual for the Rescue Service" and "Emergency Field Care and Transportation of the Injured," which will be used as training manuals. Advanced training in these subjects will be pursued after squad members are inducted into the U. S. Citizens Defense Corps. Preinduction training includes a basic course in first aid.

DUTIES OF STRETCHER TEAMS IN EMERGENCY SERVICE

The medical division of the Office of Civilian Defense in an operations letter issued June 30 defines the duties of stretcher teams of the Emergency Medical Service. Rescue squads are now to assume the duties formerly assigned to the stretcher teams at major incidents with many trapped casualties. In addition to the technical work of rescue, this includes emergency care and transport of casualties from the scene of an incident to an ambulance or to a point where medical service is available. Stretcher teams remain, however, an essential part of the Emergency Medical Service. The functions of the teams as outlined in the new statement are as follows:

1. Assisting medical personnel at casualty stations in handling and nonprofessional care of minor casualties.
2. Unloading ambulances and assisting in reception of casualties at hospitals.
3. Performing rescue work at minor incidents not requiring specialized rescue squads.
4. Assisting rescue squads at major incidents at which many casualties are trapped.

A stretcher team is composed of a leader and four other persons, preferably men and older boys from the neighborhood of the facility to which they are attached. The medical division urges that members of a hospital staff who have maintenance functions should not be selected for duty on a stretcher team.

All team members must meet the requirements of OCD regulations for membership in the U. S. Citizens Defense Corps by completing either an American Red Cross or a Bureau of Mines first aid course. If a Red Cross or Bureau of Mines instructor is not available, instruction in first aid may be given by some other qualified person certified by the chief of Emergency Medical Service.

HEALTH OFFICIALS IN CIVILIAN PROTECTION ORGANIZATION

In order that health and sanitation may be maintained during and after an air raid, health officers, with their deputies, division chiefs and sanitary inspectors, should be members of the U. S. Citizens Defense Corps, the Office of Civilian Defense advises in Operations Letter No. 131. Commanders of the U. S. Citizens Defense Corps are urged to appoint health officers to their staffs.

Health officers should develop plans for prompt action in emergencies to assure (1) maintenance of safe water, food and milk supplies, (2) sanitary disposal of sewage and putrescible wastes, (3) sanitation at mass feeding centers, rest centers, casualty stations, billets and other temporary facilities for war emergencies, and (4) control of communicable disease, the operations letter points out.

In communities in which the health department does not have sufficient staff to provide sanitary supervision and inspection services in a war emergency, the health officer may select volunteer health deputies and recommend their appointment to the staff unit of the Citizens Defense Corps. Tasks to which they may be assigned include supervision and inspection of disinfection of fractured water mains, pasteurization of milk, and preparation and handling of food at emergency feeding centers.

A section of the operations letter is devoted to the place of state health agencies in the civilian protection program. State defense councils are urged to obtain the guidance and leadership of the state health officer in the development of an emergency health and sanitation program throughout the state.

NURSES' AIDES ELIGIBLE FOR CIVILIAN SECURITY BENEFITS

All volunteer nurses' aides should be enrolled in the U. S. Citizens Defense Corps, the medical division of the Office of Civilian Defense states in a special announcement, Circular Medical Series No. 32. The immediate importance of this announcement lies in the fact that nurses' aides must be enrolled in the Nurses' Aide Unit of the Citizens Defense Corps if they are to be eligible for the benefits provided under the War Civilian Security Program of the Federal Security Agency for all members of or trainees for the Citizens Defense Corps who may be injured in line of duty. Nurses' aides at present working in hospitals and health agencies are considered to be in training for service in care of the wounded in the event of an enemy attack or other wartime disaster. They are therefore eligible for membership in the Defense Corps and are thus eligible for the benefits of War Civilian Security after enrolment. It is suggested that the local chief of Emergency Medical Service and the local nurse deputy arrange with the Red Cross Nurses' Aide Committee to have the required CDC oath administered at the graduation ceremony. All nurses' aides who have completed their training since the program was initiated but have failed to enroll in the Defense Corps should now become enrolled members. Women who are still undergoing preliminary training as nurses' aides but have not yet graduated are also eligible for benefits if they are properly registered with the personnel officers of the appropriate Citizens Defense Corps as trainees for the nurses' aide unit.

MISCELLANEOUS

DR. RAYMOND W. WAGGONER APPOINTED CONSULTANT IN PSYCHIATRY

The Selective Service Bureau of the War Manpower Commission announced on July 21 the appointment of Dr. Raymond W. Waggoner as consultant and adviser in psychiatry to the director of Selective Service. Because of the large percentage of registrants who are rejected on examination for neuropsychiatric reasons it was considered of the utmost importance to have all pertinent data on registrants, which might be used for the guidance of psychiatrists at induction stations, assembled and forwarded to them by local boards. Dr. Waggoner will advise on psychiatric problems, which will include methods of assembling such data. Dr. Waggoner graduated from the University of Michigan Medical School in 1924; he was formerly associate professor of neurology at the University of Michigan and has been professor of psychiatry and director of its Neuropsychiatric Institute since January 1937.

PHYSICIANS NEEDED FOR CIVILIAN WAR SERVICE

The shortage of physicians to engage in war work in the civilian branches of the government continues. This need resulted in a liberalized civil service examination for medical officers in 1941. The Civil Service Commission has just revised and reannounced this examination. The twenty optional branches under which doctors may apply range from General Practice to Aviation Medicine. Those appointed will perform professional duties as doctors of medicine in active practice in hospitals, in dispensaries, in the field or in rural areas or in bureaus of the government. Doctors will also be used in industrial establishments under direction of the War Department. Applicants for all grades must have received the degree of M.D. from an accredited medical school. Applicants for the senior medical officer grade ($5,228 a year) must have had at least five years of appropriate medical experience, for the medical officer grade ($4.428 a year) three years of experience in addition to a required internship and for the associate medical officer grade ($3,828) one year of internship. The salaries quoted include overtime pay. There are no written tests and no age limits. Persons now using their highest skills in war work should not apply for these positions. Appointments in federal positions are made in accordance with war manpower policies and employment stabilization plans. Before a definite offer of appointment is made, eligibles are cleared through the Procurement and Assignment Service for Physicians, Dentists and Veterinarians of the War Manpower Commission. Persons rated eligible on the medical officer examination of 1941 need not file applications again unless they consider that they now possess qualifications for eligibility in a higher grade or different option. Application forms may be obtained at first and second class postoffices, civil service regional offices and the commission in Washington, D. C.

NYLON FILTERS FOR TRANSFUSION PURPOSES

A fine weave nylon cloth having 30,000 holes per square inch is being used by several laboratories as a filter during the processing of blood plasma for the Army and Navy. Small nylon bags have also been devised for filtering either plasma or whole blood during actual transfusions. Dr. S. Brandt Rose, chief of the bacteriologic laboratories of the Philadelphia General Hospital, announces in *Science* that the new type filters have been successfully employed in more than a thousand transfusions. Dr. Rose said that while it is desirable that fresh blood be filtered immediately before it is transfused, this precaution is mandatory when stored blood or plasma is used. The nylon fabric has several desirable characteristics as a filter. Dr. Rose states that no instance of sensitivity to nylon has been observed in more than a thousand blood and plasma transfusions made with the filters during the past eight months and no reactions have followed the administration of plasma in 200 cases.

ORGANIZATION SECTION

OFFICIAL NOTES

MEDICAL SERVICE AND PUBLIC RELATIONS

Minutes of Meeting, July 21, 1943

The Council on Medical Service and Public Relations, Dr. James E. Paullin, President of the American Medical Association, presiding, met in the Board of Trustees Room at the headquarters of the American Medical Association.

There were present Drs. A. W. Adson, Louis H. Bauer, John H. Fitzgibbon, W. S. Leathers, E. J. McCormick, James R. McVay, Ernest E. Irons representing Dr. Roger I. Lee, James E. Paullin and Olin West, members of the Council; Mr. J. W. Holloway, Director of the Bureau of Legal Medicine and Legislation, and Dr. R. G. Leland, Director, and Mr. A. M. Simons, member of the Staff, of the Bureau of Medical Economics. The President announced that Dr. Roger I. Lee and Brig. Gen. Fred W. Rankin had found it impossible to be in attendance.

Dr. West reported that he had taken the responsibility of communicating with members of the Council, assuming that they would wish to have a meeting for organization, the preparation of a budget and a consideration of the nature of the work to be undertaken.

Nominations were called for and Dr. McVay nominated Dr. Louis H. Bauer, who was elected Chairman by unanimous vote.

Dr. Bauer stated that he would try to do his utmost, realizing that the burden would be taken from his shoulders to some extent when a permanent secretary is secured. Most important was the selection of the right man for that purpose, who will be in Chicago and conduct the Council's work according to the suggestions of its members. Some had suggested that the Secretary be a physician. After the views of members were presented, Dr. Bauer stated that the consensus was that the Council should try to secure a physician, if possible; if it is not possible to secure a physician, it will be necessary to get a competent layman with the proper medical point of view. Any physician secured should have the proper public relations point of view and any layman secured should have the proper medical point of view.

Consideration was given to salaries and budget.

The Chairman suggested that the Council propose a program before considering the budget. The functions of the Council as stated in the report adopted by the House of Delegates in June were read by Dr. West. Dr. Adson presented to each member of the Council proposed agenda. The discussion, in which it was suggested that committees be appointed to study some of these questions, continued until the Council recessed for luncheon.

The Chairman stated in the afternoon session that it seemed that two or three outstanding subjects on which to concentrate should be selected by the Council. He suggested the hospital-physician relationship; what approach the Council should make to the Wagner-Murray-Dingell bill; discussion of representation in Washington, and the relation of the Council to other organizations.

A committee of three members of the Council was appointed to consider the matter of securing a secretary. Consideration was given also to the budget. The committee members are Drs. Bauer, West and McCormick.

The Chairman appointed Drs. Adson, Leathers and McVay as members of a committee to determine the present status of work and a proposed program.

The Council voted to have another meeting on September 9 and 10.

Dr. Adson asked the opinion of the Council as to what it thought about committees on medical service and public relations in state associations and component county societies. The consensus was that it would be better to ask these units which of their committees they desired to have as the outlet for the Council on Medical Service and Public Relations of the American Medical Association.

The Chairman felt that press relations were part of the work of the Program Committee and suggested that Dr. Fitzgibbon could consider, in collaboration with the Program Committee, the manner in which the material of the Council can be filtered through.

Dr. West stated that the Council might be of important help in that its members or others they might secure could appear before Congressional committees when necessary; he stressed the necessity of making the best possible selections for this purpose.

Dr. Adson informed the Council concerning the work of the committee of the American Dental Association in Washington.

Dr. West, in the discussion of the question of who would act as temporary secretary until the Council secured a permanent one, informed the Council that Mr. Holloway, Director of the Bureau of Legal Medicine and Legislation, had agreed to act as temporary secretary if the Council so desired. Mr. Holloway, on being asked by the Council, stated that he would be glad to serve as temporary secretary. It was moved by Dr. McCormick, seconded by Dr. Adson and carried, that Mr. J. W. Holloway be asked to act as temporary secretary until a permanent secretary of the Council is secured.

Dr. West presented several matters that had been received at the offices of the Association that might later come to the attention of the Council. No action was taken on any of these matters but they were referred to the Program Committee for consideration as to priority of action.

The Council adjourned at 4:30 p. m.

SUMMER HEALTH HINTS

The next two programs for the series of broadcasts over WLS on Thursdays at 2:45 p. m. under the title "Summer Health Hints" will be as follows:

August 12. "Hiking."
August 19. "Hay Fever Time."

A new series of broadcasts on appropriate, timely, health topics is contemplated on station WLS beginning in early autumn.

WOMAN'S AUXILIARY

Pennsylvania

A recent meeting of the Philadelphia auxiliary was of unusual interest, as it was the first time that a combined meeting was held of the First Councilor District of the state medical society, Dr. George C. Yeager, councilor, and the First Councilor District of the state auxiliary, Mrs. W. Burrill Odenatt, councilor. Among the 100 guests present were Dr. Gilson Colby Engel, vice president of the state medical society, Dr. William Bates, president of the Philadelphia County Medical Society, and Mrs. Leon C. Darrah, councilor of the Second District. The president, Mrs. George C. Yeager, introduced the officers and speakers. Dr. Yeager presented certificates to sixteen physicians who have been in practice fifty years. Dr. William Egbert Robertson spoke on "Fifty Years of Medicine." Dr. Hubley R. Owen, director of health of the city of Philadelphia, told of his recent trip to England, where he visited hospitals.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Charles H. Danforth, Ph.D., professor of anatomy at the Stanford University School of Medicine, San Francisco, has been appointed to the honorary position of librarian of the California Academy of Sciences.——Dr. Romeo R. Root, Riverside, among others, received a gold headed cane in May in recognition of his long service in the Riverside County Medical Association.

Drugless Practitioners May Sign Death Certificates.—Drugless practitioners may legally sign death certificates, according to an opinion released on June 23 by Attorney General Robert W. Kenny, newspapers reported. In Kenny's opinion, given to the board of medical examiners, he pointed out that the California courts had never ruled on the legality of the question. "In thus making it possible for the drugless practitioner to sign death certificates, it should of course be realized that the implication is not to be conveyed that such drugless practitioners may call themselves or advertise themselves as 'physicians' or that they may practice 'medicine.' A drugless practitioner receives his license from the board of medical examiners. By law the mode of treatment of human diseases, injuries and deformities employed by drugless practitioners is recognized. It is difficult for me to believe that a drugless practitioner in attendance on such a patient should not be qualified to file the certificate of death as well as the medical certificate."

COLORADO

Changes in State Medical Board.—New officers of the Colorado State Board of Medical Examiners for the period July 1, 1943 to June 30, 1945 include Dr. B. Franklin Blotz, Rocky Ford, president; C. Robert Starks, D.O., Denver, vice president, and Dr. John B. Davis, Denver, secretary-treasurer. Membership of the board includes Drs. Blotz, Davis, George H. Gillen, Denver; Robert J. Groom, Grand Junction; Walter W. King, Denver; William P. McCrossin Jr., Colorado Springs; George A. Unfug, Pueblo; C. Robert Starks, D.O., and Rodney Wren, D.O., Pueblo.

DISTRICT OF COLUMBIA

Physicians Organize Panel for Emergency Services.—A panel of 338 physicians has been established for medical care during emergencies, to be available through the medical bureau of the Medical Society of the District of Columbia. The physicians will respond to calls in any part of the city where their services are urgently needed and will report through the medical bureau, which maintains a twenty-four hour switchboard, and will cooperate with other physicians who have accepted the chairmanship of various sections of the city. The sections are divided to conform with those designated by the Selective Service System. The operation of the new setup is the result of a plan initiated several months ago (THE JOURNAL, March 6, p. 774). The announcement to the press was made by Dr. A. Magruder MacDonald, chairman of the committee on medical service for the district, which includes representatives of seven medical and health agencies, namely the district medical society, the U. S. Public Health Service, the district health department, the Emergency Medical Service for Civilian Defense, the District Procurement and Assignment Committee, the Health Security Administration and the Medico-Chirurgical Society, which is made up of colored physicians. Out of the 338 physicians who volunteered to serve on the panels in the twenty-five selective service districts of the city, 189 are general practitioners and 128 are specialists who agreed to do general practice if necessary.

KANSAS

Dr. Crumbine Honored.—In the first ceremony of its kind in history, the state of Kansas recently officially honored Dr. Samuel J. Crumbine, Jackson Heights, N. Y., who for many years served as secretary of the Kansas State Board of Health and as dean of the University of Kansas School of Medicine (THE JOURNAL, Nov. 28, 1942, p. 1050). The Crumbine plaque, cast for presentation to Dr. Crumbine at a testimonial dinner in New York in 1942, was officially unveiled in the Topeka Hall of Fame. A "Dr. Crumbine Week" was officially declared throughout Kansas and the Missouri Pacific Railroad, the first railroad to abolish the "common drinking cup," a movement launched by Dr. Crumbine, sponsored a publicity campaign throughout eleven states designating July as "Dr. Crumbine Month." According to the *Health Officer News Digest* final preparations are under way to name a new train car "The Dr. Crumbine."

MASSACHUSETTS

License Revoked.—The state board of registration in medicine on June 28 revoked the license to practice medicine in Massachusetts of Dr. Philip L. Manfredi, Boston, because of "gross misconduct in the practice of his profession."

Rehabilitation Program for the Tuberculous.—The executive committee of the Lynn Tuberculosis League has approved a rehabilitation program for Lynn residents with tuberculosis, including plans to employ a rehabilitation specialist. Five hundred dollars was also appropriated to provide educational and vocational scholarships for persons with tuberculosis ineligible for such vocational aid from governmental sources and will be available to those at home who have never needed sanatorium care as well as to those who have taken sanatorium treatment. It is planned for the tuberculosis specialist to begin work sometime in September, allowing a period for specialized training under the direction of the National Tuberculosis Association.

MINNESOTA

License Restored.—The license to practice medicine of Dr. Arthur H. Langhoff, Glencoe, which was suspended by the state board of medical examiners, Feb. 13, 1942, was restored by the board on May 7.

Personal.—St. Olaf College, Northfield, recently conferred the honorary degree of doctor of laws on Dr. Donald C. Balfour, director of the Mayo Foundation for Medical Education and Research, Rochester, and the honorary degree of doctor of science on Dr. Adolph M. Hanson, Faribault, in recognition of work on the isolation of the active principles of various hormones. Dr. Balfour was also recently elected an honorary fellow of the Royal Society of Medicine.——Dr. Theodor E. Bratrud, Minneapolis, recently received an alumni award of the Marquette University School of Medicine, Milwaukee, for a paper submitted at an alumni clinic, entitled "Congenital Adrenal Hyperplasia."

NEW JERSEY

State Medical Election.—Dr. Joseph F. Londrigan, Hoboken, was chosen president-elect of the Medical Society of New Jersey at its recent annual meeting in Newark. Dr. Ralph K. Hollinshed, Westville, was installed as president to succeed Dr. Elias J. Marsh, Paterson. Dr. Alfred Stahl, Newark, is the secretary.

Endowment Fund for Research.—Acting on the suggestion of Dr. Elias J. Marsh, Paterson, president of the state medical society in 1943, members of the society have been submitting contributions to establish an endowment fund for the support and encouragement of original investigations conducted by members. At the present time the fund has four $100 war bonds and almost enough cash to purchase the fifth. In his proposal to the house of delegates to create a scientific research fund Dr. Marsh said "This will compensate for the lack of any generally available teaching or research institution in our state. We have in New Jersey plenty of ability, plenty of scientific spirit and plenty of clinical and other material to produce good original work but we lack facilities for bringing them together in a practical and fruitful way."

NEW YORK

License Restored.—The state board of medical examiners at a meeting on June 18 restored the license to practice medicine in New York of Dr. Julius Hammer, Scarsdale.

Personal.—Donald K. Tressler, Ph.D., since 1933 chief of research and head of the division of chemistry, New York Experiment Station, Geneva, has joined the staff of the General Electric Company; he will be concerned chiefly with research on refrigeration and the freezing preservation of foods, working in the laboratories at Bridgeport, Conn.——Alfred E. Sherndal, Ph.D., plant superintendent, has been elected vice president of Winthrop Chemical Company, Rensselaer.——Dr. Walter B. Martin, warden of Clinton Prison at Dannemora, has been appointed warden of the Attica Prison, effective July 1.

New York City

Education Program to Obviate War Shock in Seamen.—A medical education program under the auspices of the United Seamen's Service and the War Shipping Administration to help merchant seamen avoid war shock will be started under the direction of Dr. Florence B. Powdermaker, the New York *Times* reported on July 9. The program will be supervised by the U. S. Public Health Service.

Promotions at Rockefeller Institute.—The Rockefeller Institute for Medical Research announced the following promotions on its scientific staff: assistant to associate, Merrill W. Chase, Ph.D., Stanford Moore, Ph.D., Isabel M. Morgan, Ph.D., Howard A. Schneider, Ph.D., and William H. Stein, Ph.D.; fellow to associate, D. Wayne Woolley, Ph.D., and fellow to assistant, Dr. Sidney Rothbard.

Three-Cents-A-Day Plan Expanded.—On July 19, 257 member hospitals of Associated Hospital Service of New York approved a plan of expanded service for the 1,365,000 members of the Blue Cross three-cents-a-day plan. In addition to providing hospital bed and board, prescribed diets, general nursing care and anesthesia when administered by a hospital employee, Blue Cross members who occupy semiprivate accommodations may now use the operating room as often as necessary, the former $25 limitation being removed. All x-ray examinations consistent with the treatment required will be provided, the $25 limitation being waived. Laboratory examinations, formerly held to $20, are now limited only by the need. All drugs and medications are now provided, as are all dressings and plaster casts. The use of the cystoscopic room, cardiographic equipment and physical therapeutic equipment are made available at no added cost, as are basal metabolism tests. After twenty-one days of hospitalization members receive a 50 per cent discount for an additional period up to ninety days on all regular hospital charges, including the services listed. The rate of payment to hospitals has now been increased to compensate them for this more comprehensive service. An extra allowance is likewise provided for those members who wish private room accommodations. Another phase of the new program is the making available individual memberships to men and women under 60 years of age who cannot enroll through a place of employment.

NORTH CAROLINA

Dr. MacNider Retires as Head of Pharmacology Department.—Dr. William deB. MacNider, Kenan research professor of pharmacology and head of the department at the University of North Carolina School of Medicine, Chapel Hill, will relinquish his responsibilities as head of the department on September 1. He will continue in the department as research professor. Dr. Grant L. Donnelly has resigned as associate professor of pharmacology in order to resume the practice of medicine.

New Hospital for Early Treatment of Venereal Diseases.—The North Carolina State Board of Health has accepted an offer made through the Federal Works Agency for $210,200 annually to establish in Charlotte a hospital for the intensive treatment of venereal diseases in the early stages. The board signed a lease with the Palace Realty Company of Charlotte whereby the Charlotte Sanatorium is to be used for the purpose. About 200 patients can be accommodated at one time. The U. S. Public Health Service will provide a chief medical officer, a chief nurse and a record analyst. The Zachary Smith Reynolds Foundation has given $25,000 to the board to be used in establishing a closer administrative supervision throughout the state.

PENNSYLVANIA

Personal.—Dr. Anthony J. Sparta has been named health officer of Easton, succeeding the late Dr. Reuben S. Raub, who died, May 28.——Dr. Eugene L. Sielke, formerly assistant superintendent of the Philadelphia State Hospital, is now superintendent of the Danville State Hospital, Danville.

Philadelphia

Pharmacologic Changes at Sharp and Dohme.—Arnold D. Welch, Ph.D., who, since June 1940 has been in charge of the pharmacologic research laboratories of the medical research division of Sharp and Dohme, has been made director of research of the division. According to *Science* he will continue to direct the general activities of the pharmacologic and nutritional laboratories. Dr. Karl H. Beyer, who recently joined the medical research division, has been named assistant director of pharmacologic research. Paul A. Mattis, D.Sc., who is supervising the histologic and toxicologic work of the department, will serve as assistant department manager.

Changes in the Faculty at Jefferson Medical College.—Dr. Paul C. Swenson, associate professor of radiology at the Columbia University College of Physicians and Surgeons, New York, has been appointed professor of roentgenology at Jefferson Medical College of Philadelphia and Dr. James Rudolph Jaeger, assistant professor of surgery (neurosurgery), University of Colorado School of Medicine, Denver, has been appointed professor of neurosurgery. Other appointments to Jefferson include those of Dr. William G. Sawitz, assistant professor of parasitology; Dr. Joseph Stasney, assistant professor of pathology, and Dr. Francis M. Forster, assistant professor of neurology.

Alvarenga Prize Goes to Ernest Faust.—On July 14 the College of Physicians of Philadelphia awarded its Alvarenga Prize to Ernest C. Faust, Ph.D., professor of parasitology and acting head of the department of tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans, for his "outstanding contribution to our knowledge of parasitology and tropical medicine." This prize was established by the will of Pedro Francisco Da Costa Alvarenga of Lisbon, Portugal, an associate fellow of the College of Physicians, to be awarded annually by the College of Physicians on each anniversary of the death of the testator, July 14, 1883, to the author of the best memorial on any branch of medicine which may be deemed worthy of the prize.

RHODE ISLAND

Mr. Farrell Becomes Executive Secretary of State Society.—On July 1 Mr. John E. Farrell, executive secretary of the Providence Medical Association for the past five years, became executive secretary of the Rhode Island Medical Society and managing editor of the state medical journal. The executive office of the society and the business office of the journal will be maintained at 106 Francis Street, Providence 3. Mr. Farrell will continue as executive secretary for the Providence Medical Association (THE JOURNAL, June 5, p. 388).

SOUTH CAROLINA

Crippled Children's Home Transferred to State.—The Florence County Crippled Children's Home was formally transferred to state ownership during special ceremonies on July 1, the result of a special act of the legislature. Under state management the unit will be known as the South Carolina Crippled Children's Convalescent Home and is said to be the first state owned convalescent home in South Carolina. Located on a 6 acre tract on the Florence Timmonsville Highway, the home, established in 1937, consists of two large buildings, one for white children and one for Negroes, connected with a smaller building which houses the central kitchen and heating plant. It is equipped with a modern swimming pool and has a capacity of 50 beds and cribs. Beginning on August 1 the home was to be equipped and staffed for physical therapy treatments. Newspapers report that the home will be operated under the division of crippled children under the state department of health, which is under the direction of Dr. George S. T. Peeples, Columbia. Dr. James A. Hayne, Columbia, state health officer, in his speech of acceptance stated that Dr. Peeples would be advised by a subcommittee of the state board of health's executive committee composed of Drs. Walter R. Mead, Florence, William R. Wallace, Chester, and William L. Pressly, Due West.

TENNESSEE

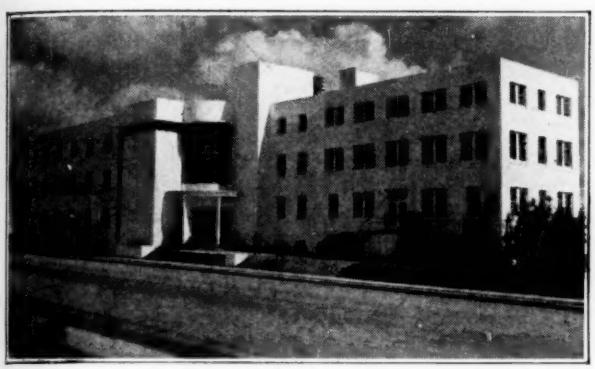
Changes in Health Officers.—Dr. Harcourt A. Morgan Jr., Lewisburg, head of the Bedford County Health Unit, has been placed in charge of a seven county area including the six adjacent counties of Grundy, Franklin, Warren, Bedford, Marshall, Moore and Coffee with headquarters at Manchester.——Dr. Chester A. Hicks, Elizabethton, director of the health unit of Carter, Johnson and Unicoi counties, has resigned to become director of health of the city of New Rochelle, N. Y.——Mr. Lowell H. Stokes, McMinnville, in charge of the Warren County Health Department, has been appointed to a similar position in Knox County.

Physician Honored.—Dr. Edward C. Ellett was guest of honor at a dinner recently, given by the Memphis and Shelby County Medical Society to honor his completion of fifty years' active practice in Memphis. In 1939 Dr. Ellett was awarded the Leslie Dana Medal through the National Society for the Prevention of Blindness and in 1942 he received the award of merit from the American Academy of Ophthalmology and Otolaryn-

gology in recognition of his services as president and member of the council. Dr. Ellett was secretary of the Section on Ophthalmology of the American Medical Association 1900-1901 and chairman of the Section 1914-1915 and is a past president of the American Ophthalmological Association.

TEXAS

New Home of State Health Department.—An open house on July 26 formally marked the installation of the Texas State Department of Health in its new building at 400-412 East Fifth Street, Austin. The structure was made possible by a grant of $135,105 from the federal government and $87,500 from the state of Texas. A joint resolution by the forty-seventh legislature authorized the state board of health to proceed with final arrangements. Ground breaking ceremonies were held on March 9, 1942. Because of labor and material shortages the work was held up at various times and it was not until June 18 of this year that the keys were formally turned over to the state department of health. The building is constructed entirely of reinforced concrete. The right wing is the original laboratory, to which one floor was added to be used for making biologic preparations. The left wing of the building is entirely new. The basement will contain the division of vital statistics, where fireproof vaults have been constructed in which to keep these records. On the first floor will be the offices of the state health officer, central administration, hygienic laboratories and local health services. The second floor will contain offices of sanitary engineering, public health education, central filing room, malaria control, tuberculosis control, office of civilian



Texas State Department of Health.

defense and bedding division. On the third floor will be located the division of maternal and child health of the state board, library, venereal disease control, the food and drug division, and milk inspection, public health nursing and dental division. The new part of the building is 151 feet in length and 60 feet in depth and covers one-half block of land. Now, for the first time since its inception, the state department of health will be all at one location, permitting better administrative policies with work under the direct supervision of the state health officer, Dr. George W. Cox.

WASHINGTON

New Health Activities in King County.—The enactment of recent legislation has made possible the expansion of the health program in King County. Under the direction of Dr. Wallace W. Schwabland, Seattle, health officer of the county, the appointment of Dr. Bryan Newsom, Seattle, for many years epidemiologist of Seattle, marks the beginning of a division of epidemiology in the department of health. Under a reorganization the King County commissioners have designated the county health officer to be tuberculosis administrator for the county, which means that admission of patients to the county tuberculosis institutions will be decided finally by the health officer rather than by the medical director of the sanatorium.

WEST VIRGINIA

Members of Public Health Council Reappointed.—Drs. William R. Goff, Parkersburg, William P. Bittinger, Summerlee, and Walter E. Vest, Huntington, have been reappointed by Governor Matthew M. Neely as members of the Public Health Council for the term ending June 30, 1947. Dr. Vest has been a member of the council since 1933 and president since 1937. Dr. Goff has been a member since March 1942, and Dr. Bittinger is beginning his second four year term, having first been appointed in 1939. Dr. John E. Offner, Weston, recently appointed state health commissioner, is a member and ex officio secretary of the council. The next meeting of the council will be held in Charleston, October 25-27.

GENERAL

Mead Johnson Continues Award for Vitamin B Research.—Mead Johnson and Company has renewed the arrangements for a period of five years whereby the annual award of $1,000 will be given for research dealing with the vitamin B complex. The recipient of this award will be chosen by a committee of judges of the American Institute of Nutrition.

American Medical Association Membership Waived in Orthopedic Board Requirements.—The American Board of Orthopaedic Surgery has ruled that membership in the American Medical Association is not necessary for those who wish to present themselves for part I of the examination by the board. Dates for part I are as follows: New Orleans, October 8-9; New York, October 15-16; Chicago, October 22-23, and San Francisco, October 29-30. The board had earlier sent out a notice to most prospective applicants that membership in the American Medical Association would be prerequisite and essential.

Expand Program of Physical Education.—Harold T. Friermood, Dayton, Ohio, has been appointed special secretary of health and physical education of the National Council of the Young Men's Christian Associations of the United States of America. He will aid in redirecting the group's program in relation to physical fitness, health education, swimming and water safety and in devising methods of enlisting volunteer and part time leadership for service in communities where staffs have been depleted by transfer of Y. M. C. A. secretaries and physical directors to other forms of service. Mr. Friermood has been given a leave of absence as director of physical education of the Dayton Y. M. C. A. to undertake this special service for the National Council.

Special Society Elections.—Dr. Albert A. Berg, New York, was chosen president-elect of the International College of Surgeons at its recent meeting in New York and Dr. Desiderio Román, Philadelphia, was installed as president. Vice presidents are Drs. Manuel A. Manzanilla, Mexico, D. F.; Herman de las Casas, Caracus, Venezuela; Custis Lee Hall, Washington, D. C.; Rafael Angelo Calderon Guardia, San José, Costa Rica; Ali Ibrahim Pascha, Cairo, Egypt, and Alejando Ceballos, Buenos Aires, Argentina. Dr. Max Thorek, Chicago, is secretary.——At the annual meeting of the executive board of the National Gastroenterological Association the following officers were reelected for the coming year: Drs. Anthony Bassler, New York, president; Clarence J. Tidmarsh, Montreal; Harry M. Eberhard, Philadelphia, and William W. Lermann, Pittsburgh, vice presidents; Roy Upham, New York, secretary general, national council; G. Randolph Manning, New York, secretary, and Elihu Katz, New York, treasurer.

The Poliomyelitis Situation.—The U. S. Public Health Service reported on July 28 that the incidence of infantile paralysis had reached epidemic proportions in several Southwestern states and that figures for the country during the first six and and a half months were the highest in twelve years. The New York *Times* reported on July 29 that a sharp rise in the number of cases since early June was accounted for by outbreaks in Texas, California and Oklahoma. No specific cause could be assigned for the situation, it was stated, and no predictions could be made as to the possibilities of a further spread. Figures for the week ended July 17 showed 297 cases in the United States as compared with 245 for the preceding week; 231 cases, or 94 per cent, were reported from three states, Texas, which had 102, California 90 and Oklahoma 39. During the first week in June Texas reported 6 cases, California 35 and Oklahoma none. Arizona reported 3 cases for the week ended July 17 but recorded 45 for the first half of the year. Previous to July 17 no state other than those four had reported more than 6 cases in any week this year, but in the latest report New York announced 11 cases as compared with 5 the week before, and both Kansas and Arkansas had 7 each. For the first twenty-eight weeks of this year 1,626 cases were listed for the entire country. The *Times* also reported that Hawaii is fighting infantile paralysis; 47 cases have been treated in three months, with 5 discharged as cured, the *Times* stated on July 14. Never before had Hawaii more than a few scattered cases, the report said. At the time of this report 40 patients were still under treatment in the special hospital set up for the emergency.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 26, 1943.

An Industrial Health Advisory Committee

At a conference in London Mr. Ernest Bevin, minister of labor, described the setting up of an industrial health advisory committee attached to his department. He said that in the past industrial health had been rather relegated to a separate compartment. The ordinary physician had not much knowledge of the conditions of industry and tended to regard industrial health as a matter for the specialist. But there had been great improvement during the war. The services of many part time works physicians had been enlisted and liaison made between works physicians and outside medical services. The great trouble was shortage of physicians. The employer naturally sought to get the utmost out of his machines, but he had also to study the human factor. It had been found, rather paradoxically, that a slight slowing down of the rate of production actually increased production. When machines were working at their full capacity the nerve strain was great and there was so much "standing off" and introduction of new workers on account of the exhaustion of those whom they replaced that better results were obtained by some slowing down.

Another important factor was the development of safer materials and methods and more effective safeguards. Thus the discovery of a harmless substitute for yellow phosphorus in the manufacture of matches, the introduction of leadless pottery glazes and the substitution of solvents less toxic than benzene and carbon disulfide in rubber cements were valuable advances. The duty of the new committee would be to keep step with every discovery so that the best possible use could be made of it. He believed that methods of lighting and ventilation were still in their infancy and that great improvements now used for war purposes would in time be adopted in industry in general. The committee would also concern itself with nutrition, and he was anxious that the present wartime feeding arrangements would be continued after the war, because they had been shown to be great checks against industrial ill health.

The machinery of inquiry (as distinct from research) into industrial health questions would be developed by increasing facilities for x-ray examinations, examination of blood samples and medical supervision of particular cases of illness. He believed that after the war one of the qualifications for managing factories would be a knowledge of and interest in industrial hygiene.

The chairman of the committee will be the minister of labor. Its members will comprise the chief inspector of factories, Sir Wilfred Garrett, the superintendent of the engineering department of the National Physical Laboratory, Mr. D. L. Smith, the deputy chief medical officer of the Ministry of Supply, A. J. Amor, the regius professor of medicine, Oxford University, A. W. Ellis, the chief medical officer of the Ministry of Health, Sir Wilson Jameson, the president of the Royal College of Physicians, Lord Moran (formerly Sir Charles Wilson) and John A. Ryle, Nuffield professor of social medicine, Oxford.

American Medical Officers in London

In the medical sphere this war has brought American physicians and surgeons into closer contact with British leaders and their work than ever before. The numerous American medical officers now in this country take part in the discussions before our medical societies and attend the clinics of the leaders of British medicine and surgery. Courses of one week each have been planned with the object of showing any American medical officer who is interested the working of the London hospitals and also some of the "sights of London." They come from all parts of the country and are billeted in London. Facilities have been offered by such great hospitals as Guy's, the London, St. Mary's and the Middlesex. At Guy's visits are paid to the tomb of the founder, the bookseller Thomas Guy, to the museum and library and to the accident room. They are also shown the new pathology building and the outpatient department with its new appointment system.

On the occasion of the principal public function of the Royal College of Surgeons, the triennial Hunterian Oration, Col. Elliott C. Cutler, professor of surgery at Harvard, and Prof. W. G. Penfield, neurosurgeon at McGill University, were admitted to honorary fellowship. In the presence of most of the principal London surgeons they were presented to the president by the senior vice president, who described their achievements. These two surgeons will take part in the forthcoming Anglo-American surgical mission to Russia. During the mission the senior vice president of the college, Admiral G. Gordon-Taylor, will admit to the honorary fellowship two Russian surgeons, Dr. N. N. Burdenko, director of the Operative Surgery Institute, Moscow University and surgeon in chief to the Red Army, and Dr. S. Y. Yudin of the Sklifasoviski Hospital for Traumatic Diseases, Moscow. The British members of the mission will include Major Gen. D. C. Monro, professor of military surgery at the Army Medical College, Mr. E. Rock Carling and Mr. R. Watson-Jones. The object of the mission is to study the results of war surgery in Russia and to explore the possibility of extending medical relations between the two countries.

War Casualties for the First Three Years

In the House of Commons the government gave figures for the casualties of all the forces of the British Empire during the first three years of the war (excluding deaths from natural causes). They amounted to 514,993, of which 92,089 were killed, 226,719 were missing, 88,294 were wounded and 107,891 were prisoners of war. These figures do not include the casualties of the merchant service or other civilian casualties. Because of the failure of the Japanese to notify the names of prisoners as prescribed by international law, the number of prisoners in the Far East of Indian and colonial units is not exactly known.

The fact that the figures for those killed are higher than the figures for those wounded is susceptible of explanation. In the Royal Navy this is almost always the fact because of the nature of operations. The same is true of the Air Force, whose operations are almost entirely offensive and over enemy territory, as a result of which many wounded casualties inevitably become prisoners of war.

Civilian casualties for the same period were high as a result of bombardment of towns from the air. These were 47,291 killed and 55,643 injured, a total of 102,934.

Tracing Missing Civilians

Three years ago the Foreign Relations Department of the Red Cross was set up here to make inquiries for missing civilians of all nationalities in enemy or enemy occupied territory, so that relatives and friends could maintain contact with them by a message scheme. From a handful of people the staff has grown to over 300. Of 26,000 messages sent out by the department last month only 818 came back because the address could not be traced. Inquiries for missing civilians and for foreign soldiers, sailors, airmen and merchant seamen are made. Interned British civilians in Europe and interned as well as noninterned civilians in the Far East are covered. In exceptional cases of severe hardship medical supplies are sent. Sometimes visits of inspection are arranged and reports of them sent to relatives in this country. The Red Cross message of twenty-five words costs 24 cents to send and receive a reply. Fourteen languages are permitted.

The German and Italian governments have officially recognized this message scheme. By the end of the third year of

the war the index records held over 250,000 cards, and success in handling these inquiries was over 92 per cent. Last month 141,000 messages were received from abroad. Medical supplies have been sent to a Czechoslovak unit in Russia. Drugs and medical supplies have also been sent to Latvia to be distributed by the German Red Cross. As far as can be ascertained, this has always kept faith. The department has done more for merchant seamen of allied countries than for any other group. It has extended the Red Cross cloak of comfort to the tortured minds of people who have suffered by the occupation of their countries.

Oxford University Honors Dr. Trueta

Dr. Joseph Trueta, the Spanish surgeon famous for his treatment of war wounds, has been given the honorary degree of D.Sc. by Oxford University. During 1936-1939, when civil war was waged in Spain and Barcelona was subjected to some three hundred and fifty air raids, he developed his method and applied it in the treatment of 20,000 wounded soldiers. It consisted in enclosing the wound in plaster of paris and relying on the rest so obtained to ensure healing instead of on antiseptics. This is known as the closed plaster treatment and gave him excellent results. It contrasts with the frequent dressing of wounds in the last great war. In 1939, after the defeat of the Spanish republicans, he came as a refugee to England, where he published his book "Treatment of War Wounds and Fractures." During the present war, in 1940, he was appointed by the government adviser of the minister of health to the Wingfield-Morris Orthopedic Hospital. In presenting him for the degree the public orator's deputy, Mr. J. G. Barrington-Ward, described Trueta's treatment as the enclosing of the wound in plaster of paris and the cutting off of bacteria from the main blood stream. He also spoke of the gentleness of his hand and heart. The ancient Romans gave the civic crown to a man who had saved in battle the life of one citizen; the university was right in placing its crown on the head of the man who had saved the lives of so many.

Suicides

The new statistics show a sharp rise in the number of suicides. They numbered 7,647 in 1942, 6,222 in 1941, 6,104 in 1940 and 6,387 in 1939. Yet it is the experience of most belligerent countries in this and past wars that suicides decrease during hostilities. This has happened in Britain during the present war, and in Germany the number fell in 1940. But the last quarter of 1942 showed a rise of 87 per cent (to 2,538) over the same quarter of 1940. It does not seem that political murders or suicides in concentration camps are included in the German official statistics or that suicides of imported workers are included.

All the death rates for the large cities are likely to underestimate the actual rise in mortality for several reasons. The evacuation of children, mothers and expectant mothers to rural areas might be expected to reduce the number of deaths in the cities. As the official figures relate only to civilians, the transference of large numbers of adolescents to the armed forces would reduce the civilian population exposed to the risk of tuberculosis.

Soya in Sausages

The war shortage of certain foods, particularly meat, has led to various alternatives. The wartime sausage is much eaten but has the disadvantage of containing less meat and more bread. The latest innovation in food is the use of the soya bean as an ingredient in the sausage. In future the sausage will be composed of 37.5 per cent meat, 7.5 per cent soya and 55 per cent flour and water. The Ministry of Food states that it is impossible to make more meat available for sausages, but as the protein value of soya is about thrice that of meat, the protein content of sausages will be equal to what it was before the war.

AUSTRALIA

(From Our Regular Correspondent)

June 22, 1943.

Social Trends in Australian Medical Practice

Of the various schemes for an Australian medical service, those receiving most attention are (*a*) national health insurance with medical benefits, (*b*) the plan of the Federal Council of the British Medical Association, (*c*) the New Zealand scheme, (*d*) the National Health and Medical Research Council's outline for a salaried medical service and (*e*) the scheme of the Victoria branch of the British Medical Association in Australia. The main features of the National Health Insurance and Pensions Act have been outlined in a previous letter.

THE FEDERAL COUNCIL'S SCHEME

The Federal Council of the British Medical Association in Australia consists of two representatives from each of the various state branches. It has no power to bind the state branches by its decisions but functions as a coordinating body through which their opinions can be ascertained and expressed and as a medium for communication with the federal government on behalf of the branches collectively. The first mention of planning by the Federal Council of a general medical service for Australia is found in a report of a meeting of the council in February 1940, when consideration was given to the proposal that the British Medical Association should have as its policy the provision of a general medical service for Australia. A subcommittee was appointed to consider the question, and the report drawn up by this committee was finally adopted by the Federal Council in September 1941. The report constitutes an outline of general principles rather than a practically detailed plan for a general medical service. Constant emphasis is placed on the personal relationship between doctor and patient and the right of free choice of a doctor by the individual. The basic principle is that health insurance is a practicable method of providing a complete general medical service and should be divorced from any scheme for the provision of cash benefits, such as sickness benefits and pensions. All persons having an income of less than £417 per annum should be compulsorily insured and thereafter receive medical services from a general practitioner of the individual's own choice, to whom would be available all necessary ancillary and specialist services. The necessary capitation fee is not stated, nor are details given of the system under which the practice would be conducted, but apparently an extension of the practice of the "lodge" type is envisaged. The scheme has been criticized in that (1) the doctor is placed on a twenty-four hour working basis with no allowance for sickness or holidays, (2) no provision is made for epidemics or other emergencies arising within the scheme, (3) under the capitation system of payment the doctor would tend to take the maximum number of patients to make a living and would have little time to devote to the individual and (4) methods of consultation with specialists are cumbersome, and in order to obtain the extra financial return given for specialist services the practitioner would be tempted to undertake work for which he did not have the necessary skill and experience. The apparent advantage of the scheme is that disturbance of present methods of practice would be minimal.

War Medicine and Surgery

In previous war periods the study and practice of war medicine and surgery has constituted the special province of medical members of the fighting forces. But under present conditions of total warfare when the civil population is directly threatened it has become a topic of major importance for every medical practitioner in the country. Accordingly the National Health and Medical Research Council has appointed a committee on the survey of war medicine and an associated junior research

fellow for the purpose of collecting, condensing and presenting reliable information on the subject. At regular fortnightly intervals the committee publishes an article in the form of a supplement to the *Medical Journal of Australia*. These articles cover a wide range of subjects related to problems of war surgery and medicine, and special emphasis is laid on practical experiences rather than on theoretical discussions. This work should achieve much in giving the medical men in Australia a concise and reliable account of recorded experiences in war medicine and in fitting them to meet medical emergencies affecting the civilian population.

BRAZIL

(From Our Regular Correspondent)

June 25, 1943.

Anophelines of the Amazon Basin

The importance of the Amazon basin for the production of rubber to be sent to the United States has led to an extensive plan of sanitation which is being carried out by the American and the Brazilian governments. As the main problem is malaria, the recent studies by Brazilian sanitarians in this field are of great value. A case in point is the study reported by Drs. Ayrosa Galvão and Marques Porto on the biology of Anopheles darlingi and Anopheles tarsimaculatus, which are the anophelines with epidemiologic importance in the vicinity of Belem, the largest city of the basin, with a population of 208,000, at the mouth of the Amazon. The facts concerning the biology of the adults of these two species were observed between October 1941 and June 1942. A. darlingi practically occurs only in relatively high lands, which are not flooded by the tide, and where there is fresh water with low chloride content. A. tarsimaculatus is chiefly found in breeding places with relatively high chloride concentration, on the low lands invaded by the tide. The average number of darlingi mosquitoes captured per hour indoors and outdoors, with human and animal baits, was 0.96 and 0.98 respectively. The ratio of these numbers is very nearly 1 to 1 and A. tarsimaculatus gave respectively 1.6 and 7.6 per hour, the rate being 0.21 to 1. If we compare this figure (0.21) with 1 for darlingi, the rate at which A. tarsimaculatus frequents houses is five times smaller than that for darlingi. However, as A. tarsimaculatus is 4.8 times more abundant than A. darlingi, they had almost even chances of attacking man inside houses during the period of observation. The hourly rate of house captures from October 1941 to June 1942 showed that the prevalence of A. darlingi from December to June was small in comparison to that of A. tarsimaculatus, which was then very abundant, with a maximum during March. The study of the variation of the number of specimens captured during the night indoors showed that A. darlingi is nocturnal in its habits, as most specimens enter the houses after 10 p. m., and at later hours they continue at a slightly lower rate until 6 a. m., 1 per cent of the total number of A. darlingi having been caught between 6 and 7 p. m., and 51 per cent after midnight. Diurnal captures made in the same houses showed that A. darlingi is relatively abundant until 8-9 a. m. Seventy-one per cent of A. tarsimaculatus enter houses before midnight, mostly from 7 to 8 p. m. Diurnal captures were very few. House captures made in three different places showed that the prevalence of A. darlingi in dwellings varies as new breeding places are formed. In places where A. darlingi was very prevalent these mosquitoes made up 94.8 per cent of the anophelines captured inside houses, while in outdoor captures with human bait their proportionate number fell to 70.1 per cent and with horse bait to 16.9 per cent. Nevertheless it seems that A. darlingi's preference for food varies with the seasons, as precipitin tests made during this time, which was not favorable to its development, gave a human blood index of 15.2 per cent. It is the author's opinion that many more tests must be made before a conclusion can be reached.

Brief Items

In the new Pathologic Institute of the Santa Casa de Misericordia Hospital of Rio de Janeiro, created a few months ago, Dr. Oswino Penna of the Oswaldo Cruz Institute is giving a postgraduate course on "Clinical Pathology of Malignant Growths." Twenty physicians from the interior of Brazil are taking this course.

In July Dr. Almeida Prado, professor of medicine at the São Paulo University, will begin to give a special postgraduate course in "Gastroenterology" at the Santa Casa de Misericordia Hospital of Rio de Janeiro.

Dr. João Baptista Canto, surgeon of the Rio de Janeiro Department of Hospitals, died recently at the age of 56. Graduated in 1911, he went immediately to Europe, where he worked in several hospitals, especially in France. In 1914 he took a course of war surgery under Professor Gosset in Paris. Back in Rio de Janeiro he entered the service of the city administration in the Department of Hospitals, in which for some time he was head surgeon of the Municipal Emergency Hospital.

Dr. Antonio Aleixo, professor of dermatology and leprology at the Minas Gerais University, died in Belo Horizonte at the age of 60. He contributed much to the development of the control of leprosy in the state of Minas Gerais, one of the most important foci of the disease in Brazil.

Dr. J. Oliveira Santos died a few days ago in Rio de Janeiro. He was head of the medical department of the Brazilian Sports Confederation.

Dr. Alvaro C. Carvalho, professor of medicine at the Bahia Medical School, died in Salvador, state of Bahia, at the age of 63.

The Death of Dr. Arthur Neiva

Dr. Arthur Neiva, head of the Division of Entomology at the Oswaldo Cruz Institute, died in Rio de Janeiro on June 6 at the age of 63. Dr. Neiva was one of the first assistants of Oswaldo Cruz in 1906 at the time of the foundation of the Institute at Manguinhos, a suburb of Rio de Janeiro. In his paper "A Strain of Malaria Parasite Resistant to Quinine," published in 1910 in the Archives of the Oswaldo Cruz Institute, he gave, perhaps for the first time, the explanation for the failure of quinine to protect against malaria under certain conditions. A few years later he was invited to organize the department of medical zoology and parasitology of the Bacteriologic Institute of Buenos Aires. He went also to Washington to write, in collaboration with L. O. Howard, an important monograph on insect vector of diseases. He described many new species of arthropods of South America, particularly mosquitoes, and his name is used in the parasitologic nomenclature to designate several species.

Marriages

Stanford S. Kroopf, Los Angeles, to Miss Barbara Williams of Waban, Mass., at Miami Beach, Fla., July 17.

Joseph C. Manning Jr., Savannah, Mo., to Miss Helen Elizabeth McDougle of Rochester, Ind., recently.

George Turner Howard Jr., Knoxville, Tenn., to Miss Joan Lucey of Forest Hills, N. Y., June 26.

Frank Buist Woodruff, Woodruff, S. C., to Miss Martha Thelma Courtney of Aiken, June 25.

Jefferson Eugene Morris, Moultrie, Ga., to Miss Roberta E. Haggerty at Augusta in June.

Charles S. Baer, Steger, Ill., to Miss Adelaide Ascher of Chicago Heights in June.

Bruce Ambler, Abington, Pa., to Miss Marian Jane Lawson of Altoona in June.

Raymond M. Galt, Chicago, to Miss Jane Falley of Evanston, Ill., recently.

Deaths

Frederic Vinal Hussey ✠ Providence, R. I.; Columbia University College of Physicians and Surgeons, New York, 1904; past president of the Rhode Island Medical Society; member of the New England Surgical Society; fellow of the American College of Surgeons; state regent of the International College of Surgeons at Geneva; specialist certified by the American Board of Surgery and a member of the founders group; served as a lieutenant in the medical corps of the U. S. Naval Reserve assigned to duty at Navy Base Hospital number 4 at Queenstown, Ireland, and Base Hospital number 5 at Brest, France, during World War I; since 1934 lieutenant commander in the medical corps of the U. S. Naval Reserve, organizer of unit number 5; in March 1940 was transferred to the honorary retired list; recently a member of the Rhode Island Committee of the Procurement and Assignment Service; senior surgeon to the Memorial Hospital, Pawtucket, from 1910 to 1940, when he became chief of the surgical staff; surgeon in the outpatient department of the Rhode Island Hospital from 1907 to 1919, assistant surgeon from 1919 to 1929 and since 1930 consulting surgeon; consulting surgeon to the Miriam Hospital, Providence, Westerly (R. I.) Hospital, Providence Lying-In Hospital, Notre Dame Hospital, Central Falls and the South County Hospital, Wakefield; aged 64; died, June 15, of pancreatitis.

John Milton Griscom ✠ Moorestown, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1906; emeritus professor of ophthalmology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, Philadelphia; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the Association for Research in Ophthalmology; member of the council of the American Ophthalmological Society and formerly secretary-treasurer; attending ophthalmologist and executive surgeon to the Wills Hospital, Philadelphia; consulting ophthalmologist to the Burlington County Hospital, Mount Holly, N. J., and the Jeanes Hospital, Philadelphia; aged 62; died, June 5, in Philadelphia of coronary thrombosis.

Juriah Harris Pierpont ✠ Pensacola, Fla.; Medical College of Virginia, Richmond, 1888; an Affiliate Fellow of the American Medical Association and member of the House of Delegates, 1908-1909; three times president of the Florida Medical Association and for many years councilor of the First District; past president of the Pensacola Medical Society and the Escambia County Medical Society; past president of the state board of medical examiners; served as a member and president of the United States pension board of medical examiners; formerly health officer and city physician of Pensacola; consulting surgeon to the Pensacola division of the Louisville and Nashville Railroad for many years; served as vice consul for Argentina; on the staff of the Pensacola Hospital, where he died, May 23, of myocarditis, aged 79.

William James Carroll ✠ Lieutenant Colonel, U. S. Army, retired, Hot Springs National Park, Ark.; Albany Medical College, 1916; specialist certified by the American Board of Radiology, Inc.; member of the Association of Military Surgeons of the United States, Radiological Society of North America, Inc., and the American College of Radiology; entered the medical corps of the U. S. Army as a first lieutenant in 1918; lieutenant colonel since 1937; retired, Sept. 30, 1940, for disability in line of duty; served during World War I; aged 47; chief of the radiology section of the Army and Navy General Hospital, where he died, Dec. 28, 1942.

David Edward Jones ✠ Worthington, Ohio; University of Louisville (Ky.) School of Medicine, 1928; assistant professor of medicine and director of the department of physical medicine at the Ohio State University College of Medicine, Columbus; formerly clinical assistant in orthopedic surgery at his alma mater; served as orthopedic surgeon in charge of the poliomyelitis clinic, Louisville City Hospital; at one time orthopedic surgeon in charge at the Clifton Springs (N. Y.) Sanitarium and Clinic; graduate assistant in orthopedics at the Massachusetts General Hospital, Boston, from 1929 to 1931; aged 42; died, July 10, of cerebral hemorrhage.

John Aloysius McKenna, Lansdowne, Pa.; Medico-Chirurgical College of Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; at one time instructor in surgery at his alma mater; veteran of the Spanish-American War and World War I; lieutenant colonel, medical reserve corps, U. S. Army, not on active duty; member of the school board and board of health of Lansdowne; formerly member of the Lansdowne borough council; obstetrician to the Misericordia Hospital, Philadelphia, and the Fitzgerald-Mercy Hospital, Darby; aged 67; died, May 10, of arteriosclerotic cardiovascular renal disease and uremia.

Anderson Watkins, Little Rock, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1897; emeritus professor of surgery at his alma mater, now known as the University of Arkansas School of Medicine; fellow of the American College of Surgeons; past president of the Pulaski County Medical Society; served during World War I; for many years city physician; member of the surgical staff of the Little Rock General and St. Vincent's Infirmary; member of the staff of the Baptist State Hospital; consulting surgeon to the Missouri Pacific Hospital; aged 66; died, May 26, of arteriosclerotic heart disease.

Leonard Richard Ellis ✠ Hot Springs National Park, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; past president of the Garland County Medical Society; served in the Spanish-American War, on the Mexican Border and during World War I; at one time an officer in the Arkansas National Guard; past president of the city board of health and formerly city physician; division surgeon for the Missouri Pacific and Rock Island railroads; aged 68; on the staff of St. Joseph's Hospital, where he died, May 10, of acute myocarditis.

James Alfred, Brockton, Mass.; Tufts College Medical School, Boston, 1897; member of the Massachusetts Medical Society; aged 69; died, June 12, of carcinoma of the throat.

James Burns Amberson, Waynesboro, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1868; member and at one time vice president of the Medical Society of the State of Pennsylvania; past president of the Franklin County Medical Society, Cumberland Valley Medical Association and the Waynesboro Academy of Medicine; first chief of the medical staff of the Waynesboro Hospital; Civil War veteran; aged 98; died, June 14, of arteriosclerotic heart disease and acute bronchopneumonia.

Adelbert L. Anderson, Chicago; Chicago Medical School, 1923; a teacher at the Roosevelt High School; aged 46; died, June 9, in the Passavant Memorial Hospital of coronary thrombosis.

Samuel E. Beecher, Chicago; Jenner Medical College, Chicago, 1906; also a dentist; aged 72; died, June 6, in the Columbus Hospital of chronic splenomyelogenous leukemia.

Leonard Franklin Bender ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1919; member of the American Academy of Pediatrics; chief pediatrician at the Hospital of the Protestant Episcopal Church; consulting pediatrician at the Shriners' Hospital for Crippled Children and the Northeastern Hospital; aged 49; died, June 8, of coronary occlusion with hypertensive cardiovascular disease.

Frank Robertson Boyd ✠ New York; University and Bellevue Hospital Medical College, New York, 1902; aged 65; died, May 17, in the Presbyterian Hospital of cerebral hemorrhage.

George Mason Brandt, Seneca Falls, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1909; member of the Medical Society of the State of New York; served as a lieutenant in the medical corps of the U. S. Army during World War I; aged 62; died, June 5, of cerebral hemorrhage.

Garrison Lee Brown, Euclid, N. Y.; Syracuse University College of Medicine, 1878; member of the Medical Society of the State of New York; past president and secretary of the Onondaga County Medical Society; served as health officer of the town of Clay; aged 88; died, May 27, in Saranac Lake of myocardial degeneration and nephritis.

Frederick C. Brooks ✠ St. Louis; Beaumont Hospital Medical College, St. Louis, 1900; served during World War I; member of the staffs of the Evangelical Deaconess Home and Hospital and St. John's Hospital; aged 73; died, May 14, in St. Mary's Hospital of carcinoma of the lung and rectum.

Charles M. Bumstead ✠ Monticello, Ill.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; served on the medical advisory board at Decatur during World War I, and recently as chief medical examiner for the Piatt County Selective Service Board; member of the board of the Piatt County Tuberculosis Association; at one time mayor of Monticello; chief of staff of the John and Mary E. Kirby Hospital; on the staff of the Decatur and Macon County Hospital, Decatur; aged 67; died, May 30, of nephritis and heart disease.

Daniel Ray Campbell, Rosalia, Wash.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1905; served during World War I; aged 67; died, May 31, in St. Ignatius Hospital, Colfax, of pneumonia.

Watson Emanuel Campbell ✦ Sharon, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1907; aged 61; on the staff of the Christian H. Buhl Hospital, where he died, June 5, of meningoencephalitis.

Everett B. Currier, Phillips, Maine; College of Physicians and Surgeons, Baltimore, 1893; member of the Maine Medical Association; member of the associate staff of the Franklin County Memorial Hospital, Farmington; aged 77; died, May 22, in St. Petersburg, Fla., of coronary occlusion.

Joseph Robert FitzGerald, Toledo, Ohio; Toledo Medical College, 1904; aged 65; served on the staff of the Mercy Hospital, where he died, May 25, of coronary thrombosis.

Louis James Frederick, Joliet, Ill.; Rush Medical College, Chicago, 1892; member of the Illinois State Medical Society; health commissioner of Joliet; formerly prison and county physician; on the staffs of the Silver Cross and St. Joseph's hospitals; aged 72; died, May 10, of cerebral hemorrhage.

Homer Elliott Frizell ✦ Vaughan, Miss.; University of Nashville (Tenn.) Medical Department, 1908; local surgeon for the Illinois Central Railroad; aged 59; died, May 13, of tuberculosis.

Henry Goodfriend, Boise, Idaho; Columbia University College of Physicians and Surgeons, New York, 1898; aged 67; died, May 14, of bronchopneumonia.

Dudley M. Hall, Glens Falls, N. Y.; University of Maryland School of Medicine, Baltimore, 1886; member of the Medical Society of the State of New York; served as health officer and as school physician; honorary member of the associate staff of the Glens Falls Hospital; aged 81; died, May 3, of myocardial degeneration.

Jesse Hartman, Crete, Neb.; Nebraska College of Medicine, Lincoln, 1909; aged 71; died, June 21, in the Bryan Memorial Hospital, Lincoln, of carcinoma.

Alice M. Humphrey Hatch, Des Moines; State University of Iowa College of Homeopathic Medicine, Iowa City, 1895; member of the Iowa State Medical Society; aged 79; died, June 8, of diabetic gangrene.

Thomas J. Hilliard, Fairfield, Ill.; Physio-Medical College of Indiana, Indianapolis, 1891; member of the Illinois State Medical Society; since 1941 a member of the "Fifty Year Club" of the state medical society; past president of the Wayne County Medical Society; past president of the Fairfield Rotary Club; a director of the chamber of commerce; aged 79; died, May 16, of cerebral hemorrhage.

William Kendall James, Chicago; Bennett Medical College, Chicago, 1911; member of the Illinois State Medical Society; aged 58; died, May 27, in the Englewood Hospital of chronic vascular heart disease and hypertension.

Preston Jennings Jones, Oneida, Ky.; University of Louisville Medical Department, 1907; member of the Kentucky State Medical Association; past president of the Clay County Medical Society; aged 62; died, May 10, in the Good Samaritan Hospital, Lexington, of pneumonia.

Jane Reid Keefer, Oak Park, Ill.; Woman's Medical College of Pennsylvania, Philadelphia, 1889; member of the Illinois State Medical Society; aged 80; died, May 30, of cerebral hemorrhage and arteriosclerosis.

Robert Daric Kirk, Baldwyn, Miss. (licensed in Mississippi in 1882); aged 84; died, May 5, of coronary thrombosis.

David Murton Knapp, Mendon, Ill.; State University of Iowa College of Medicine, Iowa City, 1896; member of the Illinois State Medical Society; aged 72; honorary staff member of St. Mary's Hospital, Quincy, where he died, May 5, of edema of the lungs, congestive heart disease, hypertension and sclerosis.

Norman Rudolph Kretzschmar, Ann Arbor, Mich.; University of Michigan Medical School, Ann Arbor, 1926; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; associate professor of obstetrics and gynecology at his alma mater; member of the Michigan State Medical Society and the Central Association of Obstetricians and Gynecologists; fellow of the American College of Surgeons; aged 39; died, May 5, in the University Hospital of coronary occlusion.

Robert Ray Lee, Sipe Springs, Texas; University of Oklahoma School of Medicine, Oklahoma City, 1933; aged 49; died, May 16, in Fort Worth of tuberculosis.

Eliot Horton Luther, Westfield, Mass.; Harvard Medical School, Boston, 1921; served for several years on the Harvard Infantile Commission as diagnostician and field epidemiologist; member of the Massachusetts Medical Society; aged 47; assistant superintendent of the Westfield State Sanatorium, where he died, May 2, of pulmonary tuberculosis.

William H. Lycan, Charleston, Ill.; Chicago Homeopathic Medical College, 1891; member of the Illinois State Medical Society; on the staff of the M. A. Montgomery Memorial Sanitarium; aged 77; died, May 19, of coronary thrombosis.

William Lawrence Madden, Jersey City, N. J.; University of Maryland School of Medicine, Baltimore, 1916; member of the Medical Society of New Jersey; served in the medical corps of the U. S. Army during World War I; for many years medical examiner for the bureau of communicable diseases, city department of health and the U. S. Veterans Bureau; on the staff of the Fairmount Hospital; aged 52; died, May 10, of coronary thrombosis.

Thomas A. Manes, Deckerville, Mich.; Trinity Medical College, Toronto, Ont., Canada, 1894; aged 72; died, May 12, of carcinoma of the stomach.

Cyrus Haymond Maxwell, Morgantown, W. Va.; Gross Medical College, Denver, 1898; member and past president of the West Virginia State Medical Association; past president and secretary of the Monongalia County Medical Society; aged 80; died, July 25.

John Wilson Maxwell, Chillicothe, Ohio; University and Bellevue Hospital Medical College, New York, 1899 and 1900; member of the Ohio State Medical Association; past president of the Ross County Medical Society; formerly secretary of the Ross County Academy of Medicine; aged 70; died, May 16, of carcinoma of the liver.

James Benjamin Franklin McMillan, Edinburg, Texas (registered in Texas under the Act of 1907); aged 85; died, April 15, of carcinoma of the face and throat.

Raymond Henderson McPherron ✦ Chicago; Northwestern University Medical School, Chicago, 1921; on the staff of the Woodlawn Hospital; aged 48; died, May 23, of coronary disease.

Duncan McTaggart, Naperville, Ill.; Michigan College of Medicine and Surgery, Detroit, 1894; for fourteen years member of the school board of Ray, Ind., and formerly health officer; aged 85; died, May 22, of arteriosclerosis.

Joseph Michalski, Newark, N. J.; Georgetown University School of Medicine, Washington, D. C., 1913; served as a major in the Polish Army during World War I; on the staff of the Hospital of St. Barnabas and for Women and Children; aged 53; died, May 22, of heart disease.

Frederick Coston Monks ✦ Kittanning, Pa.; University Medical College of Kansas City, Mo., 1891; past president and secretary of the Armstrong County Medical Society; aged 82; died, May 23, of cardiovascular disease.

Albert Everett Obermeyer ✦ Arcadia, Ill.; Barnes Medical College, St. Louis, 1906; member of the Morgan county rationing board; aged 66; died, May 25, in the Passavant Memorial Hospital, Jacksonville, of carcinoma of the kidney.

Reuben Stanley Raub, Easton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1905; member of the Medical Society of the State of Pennsylvania; health officer of Easton; on the staffs of the Betts and Easton hospitals; aged 61; died, May 28, of heart disease.

George Robson Renwick, Grand Rapids, Mich.; Rush Medical College, Chicago, 1892; aged 85; died, May 21, of cardiovascular degeneration, prostatism and pyelonephritis.

William Rothman, Great Neck, N. Y.; L.R.C.P., Edinburgh, L.R.C.S., Edinburgh, and L.R.F.P.& S., Glasgow, Scotland, 1938; member of the Medical Society of the State of New York; served on the staffs of the Greenpoint and Beth Moses hospitals, Brooklyn; aged 33; died, June 21, of coronary thrombosis.

Julius Albert Edward Sass ✦ Brooklyn; Long Island College Hospital, Brooklyn, 1929; instructor in the department of pediatrics at his alma mater; served on the staffs of the Israel Zion and Kingston Avenue hospitals; aged 37; died, May 31, of coronary sclerosis.

Bryant Richard Selden ✠ Sterling, Ill.; University of Illinois College of Medicine, Chicago, 1927; aged 46; died, May 29, of pneumonia.

Julius L. Selzer, Troy, N. Y.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; member of the Medical Society of the State of New York; for eight years jail physician; aged 46; on the staff of the Troy Hospital, where he died, May 22, of coronary thrombosis.

John H. Simon ✠ St. Louis; Missouri Medical College, St. Louis, 1890; at one time health commissioner of St. Louis; aged 74; was found dead, May 24, of a self-inflicted bullet wound.

Frank Salmeron Smith ✠ Nevada, Iowa; Rush Medical College, Chicago, 1882; an Affiliate Fellow of the American Medical Association; physician for the Rock Island Railroad for many years; aged 89; died, May 18, of diabetes mellitus.

Russell Aubrey Smith, Brewton, Ala.; Medical College of Alabama, Mobile, 1900; member of the Medical Association of the State of Alabama; president of the Bank of Brewton; formerly served as mayor; aged 68; died, May 25, of carcinoma of the rectum with metastasis to abdominal incision.

George Hartley Sollenbarger, Corydon, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; member of the Iowa State Medical Society; for many years a member of the school board, and city and county physician; on the staff of the Corydon Hospital; aged 72; died, May 14, of coronary thrombosis.

Isaac Zalman Stalberg, Atlantic City, N. J.; St. Louis College of Physicians and Surgeons, 1905; at one time associated with the Indian Service; served in the medical corps of the U. S. Army during World War I; formerly clinical assistant in cardiology at the Temple University School of Medicine, Philadelphia; aged 60; died, May 30, in Philadelphia of carcinoma of the liver.

Howard Frank Steele ✠ Claypool, Ind.; Indiana University School of Medicine, Indianapolis, 1920; secretary of the Kosciusko County Medical Society; aged 48; died, May 10, in the McDonald Hospital, Warsaw, of myocarditis and uremia.

Karl Johann Swenson, Portland, Ore.; University of Pittsburgh School of Medicine, 1908; received the Croix de Guerre and the Distinguished Service Cross for service during World War I; colonel in the medical reserve corps of the U. S. Army not on active duty; for many years on the staff of the Emanuel Hospital; aged 64; died, May 14, of coronary occlusion.

Theodore Fields Thompson, Lakewood, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1918; member of the Medical Society of New Jersey; served during World War I; for several years school physician; on the staff of the Paul Kimball Hospital; aged 53; died, May 23, of thrombosis of the popliteal artery, arteriosclerosis and coronary sclerosis.

Rollin Lester Thorp, Denver; Bennett College of Eclectic Medicine and Surgery, Chicago, 1889; Gross Medical College, Denver, 1895; member of the Colorado State Medical Society; formerly a member of the city school board; a member of the emeritus staff of St. Anthony's Hospital; aged 82; died, May 27, of cerebral thrombosis.

Walter Thomas Van Dament, Bloomington, Ind.; Indiana University School of Medicine, Indianapolis, 1912; member of the Indiana State Medical Association; served in France during World War I; aged 56; died, May 19, of carcinoma of the mediastinum with metastasis to the bones.

Evon Walker ✠ Ottumwa, Iowa; State University of Iowa College of Medicine, Iowa City, 1905; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; past president, secretary and treasurer of the Wapello County Medical Society; member of the staffs of St. Joseph and Ottumwa hospitals; a director of the Farmers and Merchants Bank; aged 66; died, May 17, of coronary disease.

Meyer Wigdor, Miami Beach, Fla.; Cornell University Medical College, New York, 1923; member of the Florida Medical Association; served during World War I; appointed a first lieutenant in the medical reserve corps of the U. S. Army in 1924 and in 1935 promoted to captain which terminated in 1940 by reason of declination of appointment; appointed a captain in the medical corps, Army of the United States, in July 1942 and was honorably discharged in February 1943 by reason of physical disqualification; aged 46; died, April 24.

DIED WHILE IN MILITARY SERVICE

Walter Douglas Campbell, Houston, Texas; University of Texas School of Medicine, Galveston, 1920; member of the State Medical Association of Texas; began active duty as a captain in the medical corps, Army of the United States, in June 1942; a member of the medical staff of the Waco Army Flying School; aged 46; died, April 11, in an airplane accident 5 miles north of Hubbard.

Vasco August Fanti, Wilkes-Barre, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1937; member of the Medical Society of the State of Pennsylvania; formerly city physician; served on the staff of the Wyoming Valley Homeopathic Hospital; first lieutenant in the medical corps, Army of the United States; stationed at Edgewood Arsenal, Md., where he died, June 1, of cerebral hemorrhage, aged 34.

Raynor Elmore Holmes Jr., Canon City, Colo.; Tulane University of Louisiana School of Medicine, New Orleans, 1933; member of the Colorado State Medical Society; began active duty as a captain in the medical reserve corps of the U. S. Army in January 1940; aged 34; died, July 16, 1942.

Arthur La Roe, Westfield, N. J.; Jefferson Medical College of Philadelphia, 1916; served during World War I; began active duty as a captain in the medical reserve corps of the U. S. Army in April 1941; a flight surgeon attached to the Station Hospital at Lowry Field, Denver; aged 51; died, July 21, 1942, in an airplane accident in the Latin American area.

Jerome Benedict Marciniak, Chicago; Loyola University School of Medicine, Chicago, 1932; member of the Illinois State Medical Society; served on the staff of the South Chicago Community Hospital; captain in the medical corps, Army of the United States; attached to the 103d Infantry, 328th Medical Battalion, Camp Claiborne, La., where he died, May 18, of heart disease, aged 40.

Benton Burkhart Mitchell, Fountain City, Tenn.; University of Tennessee College of Medicine, Memphis, 1934; member of Tennessee State Medical Association; began active duty as captain in the medical corps, Army of the United States, in September 1942; aged 44; died, June 10, in the Station Hospital, Fort Hayes, Ohio.

Michael Albert Nicolais, Trenton, N. J.; University and Bellevue Hospital Medical College, New York, 1929; served on the staffs of St. Francis and Mercer hospitals; major, medical reserve corps, U. S. Army; aged 38; died, May 16, of pneumonia and multiple myeloma.

Herbert Edward Orange ✠ Hempstead, N. Y.; Long Island College of Medicine, Brooklyn, 1932; first lieutenant in the medical corps, Army of the United States; aged 35; died, May 3, in the North African area.

Robert Titus Phillips, Portland, Maine; Tufts College Medical School, Boston, 1932; member of the Maine Medical Association, American Rheumatism Association and the International League for the Control of Rheumatism; diplomate of the National Board of Medical Examiners; formerly resident at the Boston City and Robert Breck Brigham hospitals, Boston; appointed a captain in the medical reserve corps of the U. S. Army in January 1941; promoted to major while a prisoner of the Japanese; aged 41; died, June 11, while a prisoner at a Japanese prison camp in the Philippine Islands.

Ralph Hunt Sullivan Jr., Lansing, Mich.; University of Michigan Medical School, Ann Arbor, 1940; for three years connected with the 119th Field Artillery of the Michigan National Guard; first lieutenant in the medical corps, Army of the United States; ordered to active duty in July 1942 with the medical department of the Army Air Corps; aged 29; died, March 27, in an airplane accident at the Tonopah Bombing and Gunnery Range in Nevada.

John Martin Wallace, Elmhurst, N. Y.; Long Island College of Medicine, Brooklyn, 1939; diplomate of the National Board of Medical Examiners; formerly resident physician at the Cornell University Infirmary, Ithaca; began active duty as a first lieutenant in the medical corps, Army of the United States, in August 1942; was assigned to the Thirty-Second Evacuation Hospital, Camp Barkeley, Texas; later commissioned a captain; aged 30; was killed in an airplane accident at Chicago, May 20.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," medical devices and cosmetics have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Ardine.—Angela Sykes, trading as Sykes Laboratories, Chicago, stipulated with the Federal Trade Commission in November 1942 to cease representing that this product is a sure contraceptive, can be relied on to prevent conception or becomes Dakin's solution when diluted in four ounces of water. Angela Sykes further agreed to cease representing by use of the word "laboratories" or any term of similar meaning that she maintains, operates or controls a laboratory in connection with the preparation and sale of this product.

Benederm.—In November 1942 Benederm, Inc., which puts out this product, and Fred W. Fox, the advertising agent, both of Los Angeles, stipulated with the Federal Trade Commission that they would cease representing that this product is healing or is a remedy or effective treatment for skin eruptions, that it renders normally present fatty detritus of the skin soluble or facilitates removal of the contained carbon particles.

Blu-Tabs.—The Reese Chemical Company, Cleveland, which puts out this product, stipulated with the Federal Trade Commission in December 1942 that it would discontinue any advertisements which failed clearly to reveal that frequent or continued use of this product may cause nervousness, restlessness or sleeplessness; that, except on competent medical advice, it should not be taken by persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble; that it should not be used in case of lung disease or chronic cough and that if a skin rash appears the use of the nostrum should be discontinued. It was provided, however, that such advertisement need only contain the statement "Caution: Use only as directed," if the directions for use contain a caution or warning to the same effect.

Brater's Powder and Brater's Asnarettes.—These are put out by John K. Brater and Company, Inc., of New York. In November 1942 that concern stipulated with the Federal Trade Commission to discontinue the following misrepresentations: that its products are beneficial for the underlying causes of asthma or are a remedy or cure for that condition; that their use will result in a quiet night or free the victim from torturous breathing, and also benefit many forms of hay fever. The company further agreed to discontinue any advertisements which failed to reveal that the frequent or continued use of the preparations should be avoided, especially by elderly persons, and should be discontinued if dryness of the throat, excessively rapid pulse or blurring of the vision appear; provided, however, that such advertisements need only contain the statement "Caution: Use only as directed," if the directions for use bear a warning to the same effect.

Curadalis.—In November 1942 one G. A. Labrador, Honolulu, T. H., entered into a stipulation with the Federal Trade Commission to the effect that he would cease representing that this product will relieve or cure all types of skin diseases and benefit those which occur among sugar cane and pineapple workers, or that it has any therapeutic value in excess of relieving minor skin irritations.

Fetherfluff Quilts and Pads.—These are sold by one Louis Katz, trading as the Sanitary Feather Works, Fort Worth, Texas, whose advertising had represented that the articles in question will cause the user to enjoy a more healthful and revitalizing sleep than competing products would; that use of his commodities offers an effective treatment for rheumatism, arthritis and similar disorders or that his quilts and pads retain their efficacy without impairment for ten years, and further that competing products will be harmful to the user. In a stipulation that Katz signed with the Federal Trade Commission in November 1942 he agreed to discontinue these misrepresentations.

Flurene Nose and Throat Drops and Flurene Salve.—One Stephen Gardner, trading as Flurene Chemicals, Ltd., Washington, N. C., entered into a stipulation with the Federal Trade Commission in November 1942 in which he agreed to discontinue the following misrepresentations in his advertising; that the nose and throat product is of benefit in relieving the nasal swelling of asthma, assisting sinus drainage or preventing hay fever, headaches or colds or that "Flurene Salve" loosens phlegm or helps break up congestion of the upper respiratory passage. Gardner further agreed to discontinue any advertisements which failed to reveal that his nose and throat drops should not be used in excessive amounts or given to infants and younger children except on competent advice, and that persons suffering from high blood pressure, heart disease, diabetes or thyroid trouble should not use the preparation except on competent advice. It was provided, however, that if the label carried a warning to the same effect, it would be sufficient for the advertisements to state "Caution: Use only as directed."

Koto Cleansing Cream, Koto Vanishing Cream and Koto Lemon-Almond Lotion.—These are put out by a William Banks, trading as Koto Cosmetic Company, Pittsburgh. In November 1942 Banks signed a stipulation with the Federal Trade Commission, agreeing to cease representing that any of these products is of value for skin troubles or effective in preventing or curing blackheads, pimples, freckles or wrinkles. He agreed further to discontinue representations that "Koto Cleansing Cream" is free from wax or will penetrate the pores; that "Koto Lemon-Almond Lotion" will whiten the skin or has been tested or approved by a chemist, or that he employs a chemist and "beautician" when such is not the fact.

Liquid Chin Strap.—This is put out by Delettrez, Inc., Long Island City, N. Y. In October 1942 the concern entered into a stipulation with the Federal Trade Commission, agreeing to cease and desist from representing that its product will help ward off the appearance of age or grayish surface lines, heighten the arch or sweep of chin lines, benefit the skin or contour thereof, or produce any physiological effect other than a temporary feeling of an astringent at the site of its application, or that the use of it will result in even temporary disappearance of crepey skin.

Man-O-Ree.—Charles P. Monroe, trading as Man-O-Ree Products, Greensboro, N. C., markets this product. In October 1942 he stipulated with the Federal Trade Commission that he would no longer represent that his product is an aid to digestion; will rid the system of poisons or gases; can be relied on to relieve gastric disturbances, heartburn, stomach disorders, nervousness and insomnia; possesses the rebuilding qualities of a tonic and is incapable of having any deleterious effect on the digestive organs. He further stipulated that he would discontinue any advertisement which failed to reveal that "Man-O-Ree" should not be used when abdominal pains, nausea or other symptoms of appendicitis are present and that its frequent or continued use may result in dependence on laxatives. It was provided, however, that it would be sufficient to include in the advertising only the statement "Caution: Use only as directed," if the directions for use in or on the trade package contained warnings to the same effect.

Padol Machineless Permanent Wave, Lifeoil Machine Permanent Wave and Dio Dane No. 100 (shampoo).—These are distributed by Bonat and Bonat, Inc., New York, which concern in December 1942 stipulated with the Federal Trade Commission to cease representing that the first-named product nourishes the hair or gives it a deeper wave, that the second-named contains lanolin or that the shampoo nourishes the hair and is not a soap.

Posturite and Ortho-Flex Mattresses.—The advertisements of these represented that they are of such construction, scientific or otherwise, as to insure correct posture during sleep; that insomnia and other serious disorders are caused by faulty mattresses; that the latter interfere with the functioning of the sleeper's organs and that healthful sleep is not possible on a soft mattress. In December 1942 the Burton-Dixie Corporation, Chicago, which sells the above-named mattresses, stipulated with the Federal Trade Commission to discontinue such misrepresentations. The corporation further agreed to cease using the term "Ultra Violet Ray Processed," either alone or in connection with the word "vitalized" or any other term of similar implication, as descriptive of its products, the effect of which might give the impression that the products have been completely sterilized or endowed with health-giving qualities which they do not possess. Further, the concern agreed to cease using on its products any labels on which appear the terms, "doctor" or "Dr.," either alone or in connection with a name, to imply that the products so labeled are made in accordance with the design, or under the supervision, of a doctor of medicine or contain special or scientific features resulting from medical determination or services.

Vanola Laxative Herb Tea.—This is put out by Wladyslaw Ochrymowicz and Theodosia Wandycz Ochrymowicz, trading as Vanola Herb Tea Company, New York. A stipulation was signed in November 1942 with the Federal Trade Commission by these persons, in which they agreed to discontinue the following misrepresentations: that their product is an adequate treatment or effective remedy for stomach disorders, headaches, dizziness or digestive disturbances or has any value except as a temporary laxative for the relief of constipation; that the condition known as sour stomach is caused by temporary constipation and is benefited by the product in question; that this preparation can be relied on to make the user healthier or has any effect in inducing sound sleep. The respondents further agreed to discontinue any advertisement which represented that this tea is safe, or which failed to reveal the potential danger in its use when nausea, vomiting or other symptoms of appendicitis are present; provided, however, that if the directions for its use wherever they appear in the labeling contain an adequate warning of its potential danger to health as aforesaid, the advertisement need only contain the cautionary statement "Caution: Use only as directed."

Zdroj.—This is promoted by the Gramercy Chemical Company, Inc., and an Andrew Borak, both trading as the Roxola Company, Brooklyn. In December 1942 they entered into a stipulation with the Federal Trade Commission agreeing to cease representing that this nostrum is "recommended by doctors for digestion" or that it has any favorable influence on the digestive processes; that it is a competent treatment for debilities of the stomach or liver; that it stimulates the secretory glands of the body or is of any benefit except as a temporary laxative for the relief of constipation. Further, the promoters agreed to discontinue any advertisements which represented that this product is safe to use or which failed to reveal the potential danger in its use in the presence of nausea, vomiting or other symptoms of appendicitis; provided, however, that if the directions for use wherever they appear contain an adequate warning of its potential danger to health, the advertisements need contain only the cautionary statement "Use only as directed."

Correspondence

BROMIDISM AFTER EXCESSIVE DOSAGE OF PROSTIGMINE BROMIDE

To the Editor:—In the June 19 issue of THE JOURNAL Dr. J. M. Nielsen reports a case of bromidism attributed to excessive use of prostigmine bromide in myasthenia gravis. The author of the report is, as he states, aware of the fact that the amount of bromide taken was small but that even with the small dose such an accumulation resulted that a blood concentration of 225 mg. per hundred cubic centimeters was eventually reached. The author explains this remarkable accumulation on the ground that for any dosage of bromide the concentration in the blood shows enormous individual variations.

On the contrary, it has been thoroughly demonstrated that the accumulation of bromide depends on definite physical characteristics and physiologic functions: dosage in relation to body weight, volume of extracellular fluid and rate of excretion of sodium chloride. The accumulation shows no greater individual variations than those of these characteristics and functions. Prostigmine bromide contains only about a third as much bromide by weight as does sodium bromide. The maximum dose of prostigmine bromide taken by the patient who was the subject of the report was 240 mg. in twenty-four hours; this would correspond to less than 83 mg., about 1⅓ grains, of sodium bromide a day. Under no circumstances could a patient so accumulate bromide on this dose as to reach a concentration in the blood of 225 mg. per hundred cubic centimeters, or one even approaching it.

The weight of the patient is not stated; but, if we assume 50 Kg. and an extracellular fluid of 20 per cent, the actual weight of sodium bromide present in the body to give a concentration of 225 mg. per hundred cubic centimeters would be of the order of 22 or 23 Gm. Bromide, during administration, is continuously excreted in the urine. But even ignoring all excretion, it does not appear in the case reported that for the full time of administration this amount of bromide, as prostigmine bromide, was administered. It seems improbable that prostigmine bromide can cause an accumulation of more bromide than is given.

In at least some of the clinical reports in the literature in which high concentrations of bromide in the blood are said to follow from low intake there is grave doubt as to whether the physician made a sufficiently careful examination to exclude the possibility of bromide being taken surreptitiously but has accepted only the statements of the patient and relatives that none was taken. In the present instance the assumption was apparently made only on this basis. Furthermore, in many cases diagnosed as bromidism the underlying difficulty is not primarily bromide but the psychopathic or psychotic state for which the bromide was taken. The finding of bromide in the blood even in small amounts gives a convenient direction to the diagnosis which without this finding would be made as some other state. Consequently the belief is held, as stated by the author of the case report, that the individual variations in response to any concentration of bromide in the blood are enormous. In the present instance there was sufficient bromide in the blood to cause symptoms. The difficulty here is that the patient did not receive enough bromide as prostigmine bromide to account for the concentration.

It is suggested here that the author was perhaps too easily convinced by the statement of the husband that there was no medication for the patient's anxious and fearful states except an occasional dose of phenobarbital.

Clinical reports of this sort become a part of the scientific literature and are used as a basis for evaluating the action of drugs—in this instance bromide—quite as much as are the results of carefully controlled laboratory investigations. Because of their important place in the literature, such reports, especially when dealing with the dosages of drugs, should be made only with the same safeguards as those expected for reports of laboratory investigations. The author may have applied such safeguards but the evidence presented does not show it.

HOWARD W. HAGGARD, M.D.,
4 Hillhouse Avenue,
New Haven, Conn.

EMERGENCY FURLOUGHS

To the Editor:—In Mr. Bondy's absence from the city I am writing concerning the procedure to obtain an emergency furlough for a serviceman stationed outside the continental United States.

Permission for an emergency furlough may be granted only by the man's commanding officer, and the military and naval authorities are placing more restrictions on the granting of furloughs. Arrangements for furloughs are rendered increasingly difficult because of the problems of locating a serviceman and limited facilities for communication and transportation. Many men are stationed where the distance involved practically precludes a furlough being granted. Servicemen may be ready to embark for foreign stations or be en route under sealed orders, in which instances they may not be reached. It is frequently impossible to reach naval personnel immediately if they are attached to ships.

Military and naval authorities frequently ask for full details. In cases of illness a doctor's diagnosis and prognosis and a doctor's statement of the need for the serviceman's presence should be quoted. The serviceman initiates a request for a furlough to his commanding officer, who may grant it at once or may ask the Red Cross field director at the army post or navy station to secure further information through the serviceman's home Red Cross chapter. The chapter Home Service worker on receipt of this request verifies illnesses, other conditions, meets any emergency needs of the family and telegraphs the field director a statement of the circumstances. The chapter neither recommends nor approves a furlough but states the facts, including recommendations of the doctor or other responsible persons.

The practice of relatives initiating the request for an emergency furlough and the Home Service worker of the chapter immediately verifying the circumstances to the field director has been endorsed by many commanding officers as a means of expediting the granting of the furlough.

If a member of a serviceman's family makes the initial request to the local Red Cross chapter, he should be advised to notify the serviceman immediately of the situation and at the same time the chapter Home Service worker should inquire into the situation and immediately telegraph a full statement of facts to the Red Cross field director serving the station where the man is located. It is desirable that two telegrams be sent, one to the serviceman from his family and one from the local Red Cross chapter to the field director. Families may send messages of their own to many places outside the United States through the facilities of the commercial cable companies. Where there are no commercial facilities available the chapter Home Service worker will telegraph Home Service, American National Red Cross, Washington, D. C., asking consideration of the furlough request and stating that no commercial cable facilities are

available. The message will then be relayed by cable or radio to the Red Cross field director at the man's post.

It seemed desirable to give a full statement so that your readers may be apprised of the factors involved. We believe that it will be helpful to publish this information in THE JOURNAL.

DON C. SMITH, Washington, D. C.
Deputy Administrator, Services to the Armed Forces.

"THE PHENOMENON OF BLACK DERMOGRAPHISM"

To the Editor:—In the article on "The Phenomenon of 'Black Dermographism'" by Urbach and Pillsbury (THE JOURNAL, February 13, p. 485) the authors state that the phenomenon was first reported by Emdin and Kusmenko in 1925; but in the discussion Anderson and Becket cited studies made on this subject sixty years ago.

The following references may also be of interest:

In 1902 Solomon Solis-Cohen (A Further Contribution to the Subject of Vasomotor Ataxia, *Tr. Assn. Am. Physicians* **17**:644, 1902) stated: "In certain patients, especially those with more or less constant red flushing of the face, if a silver probe be drawn across the flushed cheek a bluish black mark will be left, which can afterward be wiped off. I assume that this is due to the formation of silver sulphide, but I have not as yet been able to have a chemical study made."

Ten years later he wrote (Brief Notes on Vasomotor Ataxia, *M. Rec. of Rec.* **18**:21 [Jan.] 1912): "Silver, less frequently gold, copper, nickel, leaves a bluish black or brown mark when drawn over the skin of face or breast. Black mark due to talc or zinc oxide face powder must be excluded." This phenomenon was given by Leon Solis-Cohen in 1917 among the Chief Tests of Autonomic Ataxia (Sympathetic Nervous System, Reference Handbook of the Medical Sciences, ed. 3, New York, William Wood & Co. **8**:61, 1917).

A black line appeared when silver was drawn across the face in 40 per cent of 119 tuberculous patients whom I tested in 1917 (A Study of the Signs and Symptoms of Autonomic Disturbance Occurring in Pulmonary Tuberculosis, *Am. Rev. Tuberc.* **1**:289 (July) 1917).

MYER SOLIS-COHEN, M.D., Philadelphia.

TETANUS IMMUNIZATION

To the Editor:—In THE JOURNAL, June 19, page 559, Dr. Geoffrey Edsall, Boston, stated that "in the American army the official procedure (Circular Letter 34, S. G. O. [4/16/41]; Long, A. P.: Tetanus Toxoid: Its Use in the United States Army, *Am. J. Pub. Health* **33**:53 [Jan.] 1943) is to give two initial doses of fluid toxoid three weeks apart, a stimulating dose one year later or on departure for a theater of operations, . . ." I believe there is a slight error, probably typographic, as this particular circular of the Surgeon General, United States Army, states that the initial vaccination consists of three subcutaneous injections of tetanus toxoid (plain) of 1 cc. each, administered with intervals of not less than three or more than four weeks, and preferably with intervals of three weeks between doses. There are, however, some students of immunology who recommend a much longer period, up to six months, between the second and third injections, to obtain a more lasting immunity.

ROYAL DER. BARONDES, Major, M. C., A. U. S.,
Station Hospital, Camp Beale,
Marysville, Calif.

CONTINUOUS CAUDAL ANESTHESIA

To the Editor:—In the July 3 issue of THE JOURNAL Dr. Maurice Small of Parsons, W. Va., wrote a clinical note with the title "A Serious Complication of Caudal Anesthesia." In his note he states that while one of his patients was getting caudal anesthesia she went into respiratory failure and resuscitatory measures had to be instituted in order to save her life.

As a worker in the field of caudal anesthesia, I would like to make some comment on this case. There is no doubt that the needle was in the caudal space, as was proved in two ways: 1. The rate of flow of the gravity grip was 60 drops per minute. 2. The patient had good anesthesia and analgesia and had been getting the injection for a full hour before untoward symptoms appeared. If the needle had been in the spinal canal the patient would have made her exitus long before an hour had elapsed, since procaine or metycaine diffuses very rapidly through the spinal fluid. The fault, therefore, in this near catastrophe was not the site of injection but rather allowing the level of anesthesia to ascend too high.

In the method as devised at Sinai Hospital, we allow saline solution to drip in once the needle is in the caudal space, and if the rate is compatible with the caudal flow then procaine hydrochloride 1 per cent is allowed to drip in at 60 drops per minute until anesthesia is obtained to the level of the tenth thoracic vertebra or the umbilicus. When this level is obtained, the drip is cut down to 12 to 15 drops per minute, which is a maintenance dose. Of course, this maintenance dose will vary from patient to patient according to their ability to metabolize procaine.

If we review the anatomy of the uterus and its innervation, we find that the somatic innervation of the uterus comes from the tenth, eleventh and twelfth thoracic and part of the first lumbar vertebrae, so that the level of anesthesia required for the relief of uterine pains is about the level of the tenth thoracic vertebra or the umbilicus. The level or height of anesthesia depends on two factors: the rapidity of the injection and the amount of procaine hydrochloride injected. If we want higher levels of anesthesia, we can obtain it by allowing procaine to run in at the original drip, which may vary from 40 to 150 drops per minute. The procaine dissects up the extradural space higher and higher until the intercostal nerves and finally the third, fourth and fifth cervical nerves are anesthetized and the patient goes into respiratory failure. This is what happened in Dr. Small's case. By allowing the drip to run at its original rate and not testing the patient for the proper level, the metycaine which he used dissected itself up extradurally until the patient went into respiratory paralysis.

In giving caudal anesthesia for labor and delivery, it is very important that, once anesthesia is obtained, the proper level should be maintained and not allowed to rise any higher. Dr. Small's case was in reality not a complication but rather an error in maintaining the proper level.

In closing I wish to stress two important facts:

1. The most important point in the giving of caudal anesthesia is to be sure that the caudal needle is in the proper space and not in the subarachnoid space. This can be ascertained by simply allowing isotonic solution of sodium chloride to run into the caudal space as explained in the previous article.

2. Once the proper level of anesthesia is obtained, the drip must be cut down and only a maintenance dose allowed to run in. The maintenance dose required will vary from patient to patient and on the whole will probably be 10 to 15 drops per minute.

MORRIS L. ROTSTEIN, M.D., Baltimore.
Resident, Sinai Hospital.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 31, page 967.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 20-22. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Medical.* Nov. 3-4. Sec., Dr. D L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 4. Sec., C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral.* Los Angeles, Aug. 9. *Written.* Los Angeles, Aug. 9-12. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento.

DISTRICT OF COLUMBIA: * Washington, Nov. 8-9. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, Nov. 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

ILLINOIS: Chicago, Oct. 12-14. Superintendent of Registration, Department of Registration and Education, Mr. Philip M. Harman, Springfield.

INDIANA, Indianapolis, Sept. 14-16. Sec., Board of Medical Registration & Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA: * Iowa City, Dec. 27-29. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, Dec. 14-15. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 6-8. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical.* Baltimore, Dec. 14-17. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 14-15. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * Ann Arbor, Oct. 13-15. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, Oct. 19-21. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, September. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 5-6. Sec., Dr. O. G. Klein, First Nat'l Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, Aug. 2. Sec., Dr. G. H. Ross, 215 North Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Trenton, Oct. 19-20. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * *Endorsement.* Santa Fe, Oct. 11-12. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 20-23. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

OHIO: *Endorsement.* Columbus, Oct. 7. *Written.* Columbus, Dec. 4. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

SOUTH CAROLINA: Charleston, Dec. 20-22. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

VERMONT: Burlington, Dec. 15-17. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 14-17. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WYOMING: Oct. 4-5. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 21. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, Sept. 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 18-19. Sec., Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: DeLand, Nov. 6. Sec., Dr. John F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Oct. 12. Dir., Division of Licensure & Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MINNESOTA: Minneapolis, Oct. 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, Univ. of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 5-6. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Oct. 30. Sec., State Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 18. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

WISCONSIN: Madison, Sept. 18. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Council on Medical Education and Hospitals

COURSES FOR GRADUATES AT HARVARD MEDICAL SCHOOL

Harvard Medical School has informed the Council on Medical Education and Hospitals that the following continuation courses for practicing physicians published in the July 3 issue of THE JOURNAL have been canceled for the duration of the war:

Anatomy.—Microscopic Anatomy, July, August, six weeks.

Medicine.—General Course in Internal Medicine, August 1, four months. A one month course in Internal Medicine will be given for the month of October 1943. Fee, $150. Otherwise all courses in Internal Medicine have been canceled for the duration of the war.

Internal Medicine, September 1, September 15, one year. All of the one year courses in Internal Medicine have been canceled for the duration of the war.

Selected Subjects in Endocrinology and Metabolism, August, two weeks.

Military Medicine.—Military Medicine and Surgery, to be announced, two weeks.

Otolaryngology.—Bronchoscopy and Esophagoscopy, Arranged, two weeks, full time.

Pathology.—With the exception of the course Pathology of Obstetrics and Gynecology, which is still available, all the courses in pathology have been canceled for the duration of the war.

Pediatrics.—The one year course in Pediatrics has been canceled for the duration of the war.

Psychiatry and Neurology.—All postgraduate courses in these departments have been canceled for the duration of the war.

Surgery.—The courses in Endoscopy and Minor Surgery have been canceled for the duration of the war.

A new two week course in Pediatrics is to be given at Harvard Medical School, August 2 to 14 inclusive, at a fee of $75.

The one month course in General Roentgenology listed in the July 3 issue of THE JOURNAL with a fee of $50 is a part time rather than a full time course.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Abandonment of Patient Actionable Only When Injury Results.—The plaintiff scratched the tip of his right thumb in February 1936 without drawing blood. Several days later the thumb hurt and he pierced it with a sterilized needle, causing a bloodlike liquid to flow. He repeated the procedure a few days later. The pain in the thumb became more severe and on March 10 the plaintiff visited the defendant physician, who diagnosed the infection in the thumb as a "felon." He incised the tip to drain pus and found that a portion of the bone and tissue in the tip was necrotic. The physician directed the patient "to keep the thumb in a hot epsom salt or boric acid solution." The following day the physician dressed the wound, renewing the instructions previously given. The patient visited the physician daily until March 16, when, after a roentgenogram had indicated that there had been no restoration of circulation in the necrotic portion of the thumb, the physician removed a small piece of the distal phalanx. The next day the wound was again dressed. On the 18th, the thumb was very painful, red streaks appeared in the forearm from the wrist about halfway to the elbow, the patient had a temperature of 99.2 F. and a small lump appeared in the patient's armpit. On the 19th the patient again visited the physician, but the red streaks had subsided and the patient's temperature was normal. Starting that afternoon, however, the hand became extremely painful, and the patient tried unsuccessfully for five hours to reach the physician by telephone. When the physician was reached on the phone about 10 p. m., he refused, according to the patient's wife, to visit the patient on ascertaining that the patient was unemployed, stated that he would be unable to help them any further and suggested that the patient be taken to the county hospital. According to the physician, however, he

advised the wife that hospitalization was imperative and on learning that the patient was unemployed promised to arrange for admittance to the county hospital but informed her that on admittance he could no longer treat the patient. In any event, the physician's connection with the case terminated at that time. Another physician, Dr. Foster, was called and reached the patient about 10:20 p. m. He administered a hypodermic and had the patient removed to a private hospital. The next morning Dr. Foster called in Dr. Allen, a surgeon, to take charge of the case, and on March 22 Dr. Allen operated on the hand. Between that date and May 4, when the patient was removed to another hospital, Dr. Allen made numerous incisions in the hand in an effort to establish drainage and prevent the infection from spreading. Shortly after May 4 an amputation—just how extensive is not made clear—was performed. Three additional amputations were performed, the last one being performed on Jan. 11, 1937, when the arm was amputated at a point 5¼ inches from the armpit. Subsequently action for malpractice was instituted against the defendant physician, and the jury returned a verdict in favor of the patient. The trial court, however, believing that it had erroneously instructed the jury, ordered a new trial, and the plaintiff appealed to the Supreme Court of Washington.

The instruction that the trial court concluded was erroneous told the jury that if it found that the physician was negligent and unskilful in the treatment of the patient's infected thumb by withdrawing from the case while the infection was active and dangerous, and that such negligence on the physician's part proximately caused resulting damage to the patient, then the jury should return a verdict in favor of the patient. This instruction, said the court, permitted the jury to consider, as an element for which they might award the patient damages, the act of the physician in withdrawing from the case on the evening of March 19. This instruction was erroneous because there was no evidence in the record to indicate that any injury resulted to the patient by reason of the alleged withdrawal. Whatever injury may have subsequently resulted to the patient bore no causal relation to the allegedly improper withdrawal by the defendant physician. It must be remembered that Dr. Foster visited the patient about twenty minutes after the defendant allegedly terminated his connection with the case and that he then took charge of the case and moved the patient immediately to a hospital and called in Dr. Allen the next morning to take charge of the case. It is the general rule, continued the court, that when a physician undertakes to treat a patient it is his duty to continue to devote his best attention to the case until either (1) medical care is no longer needed, (2) he is discharged by the patient or (3) he has given the patient reasonable notice of his intention to cease to treat the patient so that another physician may be obtained. Abandonment of a case by a physician without sufficient notice or adequate excuse is a dereliction of duty, and if injury results therefrom the physician may be held liable in damages. Under the evidence the jury might have found that the physician had abandoned the patient without sufficient justification, and if the record contained sufficient evidence that would support a finding that by this abandonment the patient suffered injury, doubtless the instruction as given was correct. It is not, however, sufficient that the patient introduce evidence showing merely the breach of some duty by the physician; the patient must go further and show that such breach of duty resulted in some compensable injury to the patient. In this connection, the only evidence relied on by the patient is that of a physician called as a witness by the patient. He stated that the defendant physician was negligent in his treatment and that he failed to incise the infected area properly and to take necessary tests to aid him in determining the proper course of treatment, but this witness did not testify, nor is it a reasonable inference from this testimony, that the patient suffered any damage or that his condition became worse because the defendant physician terminated his care and treatment of the patient, leaving him without a physician or medical assistance for perhaps half an hour on the evening of March 19. The record contained no evidence that there was any causal connection between the situation referred to and the later suffering endured by the patient or the creation of the condition which resulted in the amputation of the patient's arm. The basic question to be determined is one of causation. It does not appear that had the defendant physician responded to the telephone call as soon as he received it on the evening of March 19 he could have reached the patient any sooner than Dr. Foster did. All the physicians who testified agreed in the opinion that from the time the red lines first appeared on the patient's arm, March 18, there was every indication that the patient was suffering from lymphangitis. We find no evidence, said the court, on which could be based a judgment for damages in the patient's favor occasioned by the physician's refusal to visit the patient on the evening of March 19.

The patient argued that the mental suffering endured by him because of his abandonment by the physician would support a verdict for judgment in his favor. It was intimated, too, that there was evidence of actual physical injury to the patient because of the defendant's failure to act on the evening in question. The patient, said the court, was not acquainted with any other physician in this particular city. He knew that his thumb and hand had become progressively worse and that while the defendant had refused to attend him he had told him that he was in need of hospitalization. Conceding that the patient might well be disappointed and mentally perturbed because of the physician's refusal to visit him, such a mental condition is not sufficient alone to support an award. In connection with this phase of the argument, the patient cited *Ricks* v. *Budge*, 91 Utah 307, 64 P. (2d) 208. In that case the plaintiff was suffering from an infected finger which had been incised by the defendant physician in that case to establish drainage. The plaintiff's condition having become worse, the physician indicated that a further operation was necessary and that the plaintiff should go to a hospital. The plaintiff then went to a hospital conducted by the defendant physician and was being prepared for the operation when the physician refused to continue to treat the plaintiff because of an old unpaid account which the physician discovered the plaintiff owed him. The plaintiff then dressed, left the hospital in the rain and walked to another hospital, where an operation was performed on his hand. The court in that case held that the plaintiff's case should be submitted to the jury, the court being of the opinion that it could not be held as a matter of law that the plaintiff had suffered no damage from the abandonment. That case, however, said the Supreme Court of Washington, is not controlling here, as it appeared that the physician admitted that at the time of his abandonment of the plaintiff in that case the patient was in a dangerous condition and in dire need of immediate attention. In this case, after Dr. Foster was retained he procured Dr. Allen to take charge of the case, no radical change in the treatment of the patient's hand was made and no operation was performed thereon until March 22.

The court accordingly concluded that the trial court properly ruled that error had been committed in submitting to the jury the question of negligence on the part of the physician and resulting damage to the patient based solely on the physician's withdrawal from the case on the evening of March 19. In effect, the Supreme Court accordingly ordered a retrial of the cause.—*Gray v. Davidson, 130 P. (2d) 341 (Wash., 1942).*

Society Proceedings

COMING MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 9-11. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Congress of Physical Therapy, Chicago, Sept. 8-11. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.

Michigan State Medical Society, Detroit, Sept. 22-24. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Northern Minnesota Medical Association, Duluth, Aug. 28. Dr. R. N. Jones, 8 Sixth Avenue N., St. Cloud, Secretary.

Oregon State Medical Society, Portland, Sept. 4-5. Dr. Thomas D. Robertson, St. Vincent's Hospital, Portland, Secretary.

Utah State Medical Association, Salt Lake City, Aug. 27-28. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 13-15. Mr. Charles H. Crownhart, 110 East Main St., Madison, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1932 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

13:165-230 (April) 1943

Postmortem Examination in Cases of Suspected Poisoning. H. J. Maldeis.—p. 165.
Significance of Some Toxicologic Procedures in Medicolegal Autopsy. A. O. Gettler.—p. 169.
Biochemical Changes in Body Fluids After Death. W. W. Jetter and Regina McLean.—p. 178.
Endothelioma of Pleura, with Report of 2 Cases. A. Saccone and A. Coblenz.—p. 186.
Effect of Change of Altitude on Corpuscular Constants of Wintrobe. R. C. Lewis, Gladys M. Kinsman, A. Iliff and Anna Marie Duval. —p. 208.
Conjoined Fetuses (Thoracopagus Disymmetros) Occurring in Set of Monozygotic Triplets: Report of Case. R. F. Messinger and E. H. Shryock.—p. 215.

American Journal of Medical Sciences, Philadelphia

205:625-764 (May) 1943

*Problem of Primary Sciatic Neuritis: (Analysis of 55 Cases). B. J. Alpers, H. S. Gaskill and B. P. Weiss.—p. 625.
New Test of Liver Function—Tyrosine Tolerance Test. F. W. Bernhart and R. W. Schneider.—p. 636.
*Familial Mediterranean Target-Oval Cell Syndromes. W. Dameshek. —p. 643.
Primary Friedländer Pneumonia. L. Hyde and B. Hyde.—p. 660.
Incidence of Bronchial Asthma in White and Negro. V. J. Derbes and H. T. Engelhardt.—p. 675.
Blood Studies in the Aged: Erythrocyte in Aged Male and Female. B. Newman and S. Gitlow.—p. 677.
*Value of Mixed Bacterial "Oral Cold Vaccine." M. Siegel, Marian G. Randall, Muriel D. Hecker and Mabel Reid.—p. 687.
Hemothorax in Blood Dyscrasias. P. Freedman, S. Levine and L. Solis-Cohen.—p. 692.
Treatment of Hypertensive Patient in Precardiac Stage. N. Flaxman. —p. 696.
Relationship Between Arteriosclerosis of Renal Artery and Hypertension: Analysis of 100 Necropsies. J. R. Lisa, D. Eckstein and C. Solomon.—p. 701.
Subcutaneous Administration of Sodium Sulfathiazole in Various Clinical Conditions. J. J. A. Lyons, D. R. Climenko and L. W. Gorham. —p. 703.
Therapy of Experimentally Induced Gangrene. K. K. Grubaugh and W. A. Starin.—p. 709.
*Studies on 2-Sulfanilamido-4-Methyl-Pyrimidine (Sulfamerizine Sulfamethyldiazine) in Man: I. Absorption, Distribution and Excretion. F. D. Murphy, J. K. Clark and H. F. Flippin, with the Technical Assistance of Elizabeth Patch.—p. 717.
Clot Retraction Time in Thrombophlebitis and Pulmonary Embolism. J. S. Hirschboeck and W. L. Coffey Jr.—p. 727.
Case of Extreme Hypotension Following Acute Arsenic Poisoning with Adequate Blood Supply to Tissues. I. H. Page, R. D. Taylor and K. G. Kohlstaedt.—p. 730.

Primary Sciatic Neuritis.—The 55 cases analyzed by Alpers and his associates were selected as authentic examples of sciatic neuritis. Thirty-seven, or 67 per cent, of the cases were in males, all but 4 of whom were engaged in heavy work and were exposed to changes in weather. Sciatic neuritis is a disease of middle age or early old age. The diagnosis of sciatic neuritis and its differentiation from secondary sciatica is not difficult. Sciatic neuritis is always characterized by tenderness of the nerve trunks and usually also of the muscles of the thigh and calf. All other diagnostic criteria, such as weakness or atrophy of leg muscles, decrease or absence of the achilles reflex, pain on stretching the sciatic nerve, sensory disturbances and the like are as characteristic for one form of sciatica as for the other. Special signs such as Lasègue's and Neri's, all of which depend on the stretching of the sciatic nerve, are also characteristic of both groups. Feiling divided the sciaticas into primary, or essential, sciatica and secondary, or symptomatic, sciatica. This classification serves all practical purposes, is accurate and emphasizes the fact that sciatica is produced by many causes. The cases of sciatic neuritis must be considered quite apart from those of other origin. The fact that no cause can be established for such cases does not justify their classification as idiopathic.

Familial Mediterranean Target-Oval Cell Syndromes.—Dameshek reported in 1940 the case of a young man of Italian origin who presented a moderately severe hypochromic anemia with numerous target cells, definite splenomegaly, moderate hemolytic icterus and generalized osteoporotic changes commonly seen in Cooley's erythroblastic anemia. He suggested that the fundamental fault in Cooley's anemia might center about the target cell, which might be the inherited defective factor. The present study concerns 10 Italian families and 1 Italian bachelor, comprising all together more than 50 individuals, all affected with what is believed to be a similar condition, but one of varying degrees of intensity. In addition, blood smears of 60 consecutive persons of Italian origin were examined for oval, target and stippled red cells. Dameshek shows that it is possible to arrange in a descending scale, beginning with the rare Cooley's anemia, various more frequent hereditary syndromes which present as a common denominator a reduction in the hemoglobin level, hypochromia, abnormalities of the red cells including the presence of target cells, oval cells, stippled cells, increased hypotonic resistance and complete refractoriness to iron therapy. At the lower end of the scale are individuals without anemia but showing increased numbers of target or oval cells. Possible relationships among the syndromes is indicated by the following: 1. Some siblings and both parents of the patients with Cooley's anemia showed the hematologic changes of mild Mediterranean target cell syndrome. 2. The various groups merged into one another. 3. Individuals of the same families occasionally showed the same variations as were noted in the groups. Cooley's anemia is probably the most severe manifestation of a hereditary disorder which occurs in people of Mediterranean origin and in which target cells and increased hypotonic resistance are prominent features. The fundamental inherited abnormality appears to lie in a disturbance of the hemoglobin metabolism which makes the nucleated red cells deficient in and unable to take on their normal complement of hemoglobin. In consequence, thin and hypotonically resistant erythrocytes (target and oval cells) are produced. Basophilic stippling and refractoriness to iron therapy are probably concomitant abnormalities. The increased hemolysis in the more severe cases may be due to the breakdown of unused hemoglobin precursors. There are resemblances between Mediterranean target cell syndromes and African sickle cell anemia. It is possible that the two conditions are closely related entities with unusual erythrocytic thinness ("leptocytosis") as one of the fundamental traits. They are important not only diagnostically but because the mating of 2 individuals with relatively mild forms may result in the appearance in the offspring of full blown Cooley's anemia or sickle cell anemia.

Mixed Bacterial "Oral Cold Vaccine."—Siegel and his co-workers report the experience of the Visiting Nurse Service of New York City with bacterial vaccines in the prevention of the more usual respiratory complications. The study was limited to volunteers of the nursing and office staffs. They were divided into two groups depending on the number of colds experienced in the preceding year. Each group was further subdivided into those with (*a*) chronic sinusitis, bronchitis or otitis, (*b*) allergies and (*c*) no clinical manifestations, making six classifications in all. A commercial product composed of mixed heat killed bacteria (about 25 billion pneumococci, 15 billion streptococci, 5 billion Hemophilus influenzae and 5 billion Micrococcus catarrhalis per dose) was prepared in the form of capsules to be taken orally. The control group was given capsules identical in appearance and containing the same ingredients without bacteria. The evidence indicates that the oral administration of a commercially prepared vaccine of mixed killed bacteria failed to decrease the incidence of acute respiratory infections, to reduce the severity or duration of such infections and to prevent secondary bacterial complications. Both control and inoculated groups had the same number of colds, and there was no significant difference in the duration of symptoms and the number and variety of complications following the colds. These observations support those made by

various investigators that, contrary to fairly widespread medical and lay opinion, the so-called cold vaccines are of questionable value as a prophylactic measure against the common cold and its bacterial complications.

Sulfamerizine in Man.—Murphy and his co-workers present observations on the absorption, distribution and excretion of sulfamerizine in human beings. To one group of persons a single dose of the drug was administered orally, subcutaneously, intravenously or rectally, while multiple doses were administered over a period of days to another group. Studies were made on the behavior of sulfamerizine in 28 convalescent patients serving as controls and on 20 patients with acute bacterial infection. The data presented indicate that after a single 3 Gm. oral dose of sulfamerizine higher blood serum levels are attained more rapidly and sustained longer than after similar amounts of sulfadiazine. Desired serum concentrations can be obtained by giving sulfamerizine sodium subcutaneously or intravenously. Sulfamerizine is readily diffused through body fluids and enters the red cell in varying concentrations. Sulfamerizine is slowly excreted in the urine in amounts roughly comparable to sulfadiazine.

American J. Obstetrics and Gynecology, St. Louis

45:731-914 (May) 1943. **Partial Index**

*Iliac Lymphadenectomy for Group II Cancer of Cervix: Technic and Five-Year Results in 175 Cases. F. J. Taussig.—p. 733.
Cerebral Complications Occurring in Toxemias of Pregnancy. J. Parks and J. W. Pearson Jr.—p. 774.
Principle of Physics as Applicable to Shoulder Delivery. C. E. Woods.—p. 796.
Effect of Local Anesthesia by Means of Pudendal Nerve Block with Novocain on Cervical Dystocia Occurring Late in First Stage of Labor: Preliminary Report. L. A. Bunim.—p. 805.
Blood Nucleotides in Pregnancy and in Toxemias of Pregnancy. R. W., Bonsnes and H. J. Stander.—p. 827.
*Incidence of Rh Factor and Erythroblastosis Fetalis in Chinese. P. Levine and Helena Wong.—p. 832.
Use of Sodium Sulfathiazole in Treatment of Septic Abortions. C. G. Johnson and J. D. Talbot.—p. 846.
Vinbarbital Sodium for Obstetric Amnesia and Analgesia. J. B. Bernstine and L. N. Prince.—p. 851.
Pregnancy After Tubal Sterilization, with Report of Case Demonstrating Epithelium Lined Connecting Tube. G. L. Carrington and J. B. Bullitt.—p. 892.
Circumcision of Newborn Infant by Cauterization. E. D. Colvin and R. A. Bartholomew.—p. 899.

Iliac Lymphadenectomy in Cancer of Cervix.—Taussig points out that radiation therapy usually fails to destroy cancer metastases in the tributary lymph nodes. Removal of these nodes was for years considered an essential feature of the radical Wertheim hysterectomy. The high operative mortality of this extensive procedure led many to abandon it. The procedure is applicable in a relatively small number of group I (League of Nations Classification) cancers of the cervix. Group II cases in which there is involvement of the parametrium or upper third of the vagina without extension to the pelvic wall are two to three times as numerous as the group I cases. Taussig attempted to obtain better results for this group by combining lymphadenectomy with irradiation of the primary tumor. Leveuf in France and the author here have independently conceived the possibility of this method of attack. Leveuf carried out this procedure in only a few cases, while the author employed it in 175 group II cancers of the cervix. The operative mortality in this group was 1.7 per cent with a mortality of 0.7 per cent in the last 140 cases. The five year survival rate of 70 patients operated on previous to October 1937 was 38.6 per cent. Comparing this with a five year survival of 22.9 per cent in 118 similar cases treated with radiation alone, there was a 68 per cent greater salvage when the lymph node removal was added to the radiation treatment. Cancer was found present in the lymph nodes in 26.8 per cent of the 175 patients operated on. A five year salvage of 21 per cent was obtained even in cases with demonstrated metastases. Lymph node dissection appears to be a valuable adjunct in the treatment of group II cancers of the cervix.

Rh Factor and Erythroblastosis Fetalis in Chinese.—Recent studies have revealed, Levine and Wong point out, that isoimmunization of the Rh— mother by the dominant Rh factor of fetal blood is the essential feature in the pathogenesis of at least 90 per cent of the cases of erythroblastosis fetalis. The intrauterine hemolysis of the fetal blood, which is responsible for erythroblastosis fetalis, is due to the action of maternal immune anti Rh agglutinins on the susceptible Rh + fetal blood. The incidence of the Rh factor is different in the white and the colored races. With a particular human anti Rh serum there are 15 per cent Rh— white individuals in contrast to values varying from 5 to 8 per cent among the colored persons. Clinical observations indicate that the incidence of erythroblastosis fetalis was 2.1 per cent for the white and 0.7 per cent for the colored races. Wong expressed the opinion that this condition is probably rare among Chinese infants. If this could be shown to be correct, one should expect to find a low incidence of Rh— individuals in a random Chinese population. This was confirmed in a study of 150 Chinese persons residing in New York City, only one of whom was Rh—. Using the anti Rh_1 serum, which may be considered as standard, Rh— persons are twenty-one times less frequent among the Chinese than among the white persons. This observation supports the contention that erythroblastosis fetalis is rare among Chinese infants.

American Journal of Physiology, Baltimore

138:687-808 (April) 1943. **Partial Index**

Effects of Exercise on Coronary Blood Flow, Heart Rate and Blood Pressure of Trained Dogs with Denervated and Partially Denervated Hearts. H. E. Essex, J. F. Herrick, E. J. Baldes and F. C. Mann.—p. 687.
Disappearance of T-1824 and Structurally Related Dyes from Blood Stream. M. I. Gregersen and Ruth A. Rawson.—p. 698.
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Effect of p_H and Certain Electrolytes on Metabolism of Ejaculated Spermatozoa. H. A. Lardy and P. H. Phillips.—p. 741.
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Effect of Pancreatectomy on Fat Absorption from Intestines. C. Vermeulen, F. M. Owens Jr. and L. R. Dragstedt.—p. 792.

139:1-170 (May) 1943. **Partial Index**

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Differential Effects of Stretch on Stroke Volumes of Right and Left Ventricles. W. G. Moss and V. Johnson.—p. 52.
Respiratory and Circulatory Responses to Acute Methemoglobinemia Produced by Aniline. B. B. Clark, E. J. Van Loon and W. L. Adams.—p. 64.
Respiratory Changes in Pulmonary Vascular Capacity. C. Dupee and V. Johnson.—p. 95.
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Depressive Effects Produced on Appetite and Activity of Rats by Exclusive Diet of Yellow or White Corn and Their Correction by Cod Liver Oil. C. P. Richter and Katherine K. Rice.—p. 147.

American Journal of Psychiatry, New York

99:633-744 (March) 1943. **Partial Index**

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Amnesia, Real and Feigned. W. G. Lennox.—p. 732.

American Journal of Surgery, New York

60:159-308 (May) 1943

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*Management of Tumors of Breast, with Special Emphasis on Problem of Cancer of Breast. G. L. Robillard, S. F. Auerbach and A. L. Shapiro.—p. 235.
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Demerol Hydrochloride: New Drug in Practice of Surgery. M. L. Weinstein.—p. 267
Lobeline in Asphyxia During Gunshot Surgery. A. J. Toman.—p. 270.

Management of Tumors of Breast.—Robillard and his associates report 351 cases of carcinoma of the breast treated since 1935 at the Brooklyn Cancer Institute. The Steinthal classification has been adopted by the authors. Radical mastectomy is the procedure of choice. Five year survivals vary from 30 to 40 per cent without evidence that such differences are due to specific modes of therapy. The fact most profoundly influencing the number of five year arrests is apparently the percentage of early or Steinthal 1 cases. Improvement over the 30 per cent five year survival rate reported forty years ago after radical mastectomy alone has not been biometrically established. The essential determinants, then as now, appear to be the rate of preoperative growth and the tendency to localization or metastasis. The five year survival rate for untreated cases is about 20 per cent. All these survivors have active lesions. After radical amputation roughly one third of the patients survive. Thirty to 40 per cent are aided by present methods of treatment. Sixty to 70 per cent are doomed to failure. The baffling intrinsic factors predicate failure in some two thirds of all cases. In the 30 per cent which are benefited, the percentage of Steinthal 1 and the radical mastectomy are the major factors for success.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

27:261-392 (May) 1943

*Sulfathiazole as a Venereal Disease Prophylaxis. R. D. Arthur and H. Dermon.—p. 261.
Results of Twenty Week Treatment Schedule for Early Syphilis. B. J. Hood.—p. 267.
Essential Steps for Successful Epidemiology in Syphilis and Other Communicable Venereal Diseases. H. Goodman.—p. 275.
Postarsphenamine Lichen Planus: Report of Case. M. H. Goodman and R. W. Reckling.—p. 280.
Problem of Latent Syphilis in General Hospital. A. Gelperin.—p. 290.
New Method for Staining Donovan Bodies of Granuloma Inguinale. F. Mortara and R. B. Dienst.—p. 296.
Further Observations on Correlation Between Clinical and In Vitro Reactions of Gonococcus Strains to Sulfathiazole: Notes on Bactericidal Effect of Human Blood on Different Types of Strains. A. Cohn and Irma Seijo.—p. 301.
Note on Cultivation of Treponema Pallidum with Preservation of Virulence. Clara C. Kast and J. A. Kolmer.—p. 309.
*Agranulocytosis: Complication Following Quinine in Case of Malaria Therapy. A. G. Franks and M. I. J. Davis.—p. 314.
Cardiovascular Involvement in Congenital Syphilis. J. Hinrichsen. —p. 319.

Sulfathiazole in Venereal Disease Prophylaxis.—Arthur and Dermon studied in a unit of Negro troops a series of 583 known exposures to contacts almost certain to be infected with venereal disease. Sulfathiazole prophylaxis was instituted the morning after exposure. It consisted of 3 Gm. after breakfast, 2 Gm. after dinner and 1 Gm. after supper. The drug was administered to 152 men, of whom 40 repeated this prophylaxis one or more times after subsequent exposures. Of 384 exposures in 259 men not followed with sulfathiazole, 42 resulted in infection, of which 9 were primary syphilis. After 199 exposures in 152 men followed by sulfathiazole prophylaxis, 1 developed a chancroid and 5 syphilis. One of these was a secondary syphilid and the rest exhibited a positive serologic test but no signs. The rate of infection per thousand exposures to venereal disease for those not taking sulfathiazole after contact was 109; for those who received sulfathiazole the rate of infection was 30 per thousand exposures. The authors conclude that sulfathiazole is a valuable adjunct to the routine army prophylaxis against venereal disease. It also seems to be of value when used alone. It is suggested that it be given when routine prophylaxis has been omitted. Sulfathiazole prophylaxis may interfere with the development of the macroscopic chancre of syphilis.

Agranulocytosis Following Quinine.—Franks and Davis report the treatment of a soldier aged 26 with quartan malarial blood for cerebrospinal syphilis. Induced malaria was terminated following the second paroxysm of fever. Five grains (0.3 Gm.) of quinine sulfate was given three times daily. Twenty-four hours after the first dose of quinine a leukopenia was noted. Five days later the patient complained of a sore throat. The tonsils and pharynx became distinctly injected and mildly ulcerated. The gums were sore and red. Palpable tender lymph nodes were noted in the cervical and submaxillary regions. Daily intramuscular liver therapy was initiated. All other medication, except quinine, was discontinued. The leukocyte count was now 2,000, the segmented cells were disappearing and the lymphocytes rose to 97 per cent. Thirty cc. of pentnucleotide given every other day caused a rise in the total leukocyte count but no increase in the number of granulocytes. Leukopenia and agranulocytosis continued unchanged. At this stage quinine was discontinued and the leukocyte count immediately increased with an accompanying rise in the segmented cells. The authors were able to find only 4 cases in the literature in which quinine was thought to be responsible for agranulocytosis. Many observers mention the deleterious effect of the benzene ring in producing granulopenia. Quinine (oxymethylcinchonine) has a molecular nucleus much like that of the benzene ring. It also contains the toxic NH radical in which the H is replaced by Ch_3, which radical likewise has been thought to be responsible for the injurious effect.

American Review of Tuberculosis, New York

47:449-548 (May) 1943

"Physiologic" Changes in Breath Sounds and Tuberculosis:, Relation between Altered Physical Findings in Upper Lobes and Primary Tuberculous Complex in Lung. R. T. Ellison and J. Gershon-Cohen.—p. 449.
Tuberculosis in Mentally Ill Patients: Problems and Difficulties of Its Treatment. A. A. Leonidoff.—p. 460.
Injection of Procaine for Pleural Pain. J. E. Farber.—p. 469.
Round Pulmonary Tuberculous Focus. I. D. Bobrowitz.—p. 472.
Roentgenology of Digestive Tract in Tuberculous. J. L. Kantor.—p. 484.
*Pectin Agar Feeding in Tuberculous Enterocolitis. P. D. Crimm, J. J. Westra and Ruth E. Thompson.—p. 493.
Tuberculous Tracheobronchitis: Pathological Study. Chia-ssu Huang. —p. 500.
Quantitative Aspects of Specific Tuberculoimmunity. H. J. Corper and M. L. Cohn.—p. 509.
Effect of Diet Low in Thiamine and Riboflavin on Avian Tuberculosis in Rats. G. M. Higgins and W. H. Feldman.—p. 518.
Examination of Pooled Sputum Specimens. C. J. Stringer and H. E. Cope.—p. 524.
Cholesterol Content of Sputum. M. Bruger and M. B. Rosenblatt, with technical assistance of Sylvia B. Ehrlich.—p. 530.

Pectin Agar Feeding in Tuberculous Enterocolitis.—According to Crimm and his associates the incidence of intestinal tuberculosis as a complication of pulmonary tuberculosis has been reported as low as 30 per cent and as high as 92 per cent. In the authors' experience, excess of calcium and of vitamins D and C in the diet did not augment the cure. Twenty-four patients, of whom 20 had far advanced and 4 moderately advanced disease, were placed on a smooth or low cellulose diet consisting of chicken, fish, ground meat, custards, simple pud-

dings, plain cake, toast, milk, fruit juices, finely milled cereals, macaroni, spaghetti and noodles. Pectin agar was given flavored and sweetened to suit the taste of the individual. It is best given with vanilla malted milk. Of the 24 patients 8, or 33⅓ per cent, died in the hospital; 10, or 41.3 per cent, have apparently recovered from their intestinal disease; 2, or 8.3 per cent, are improving and still under treatment, and 4, or 16⅔ per cent, left the hospital before studies could be completed. The authors conclude that pectin agar is of decided value in controlling symptoms of intestinal tuberculosis.

Anesthesiology, New York

4:233-344 (May) 1943

Aberrant Thymic Tissue in Lung—with Bronchial Compression and Sudden Death During Anesthesia. R. L. Patterson and E. L. Heller.—p. 233.
Effects of Nembutal (Sodium Pentobarbital) and Scopolamine on Human Subjects. M. H. Hawk and C. P. Wangeman.—p. 238.
Study of Traumatic Shock Under Certain Anesthetics. J. W. Pender and H. E. Essex.—p. 247.
Effect of Anesthetic Drugs on Bronchi and Bronchioles of Excised Lung Tissue. J. Adriani and E. A. Rovenstine.—p. 253.
Pulmonary Edema During Anesthesia: Case Reports. J. W. Bookhamer and S. C. Cullen.—p. 263.
Clinical Investigation of Anoxia in Intrathoracic Operations (Preliminary Report). T. F. Thornton Jr., W. E. Adams, H. Livingstone and V. Wellman.—p. 266.
Anesthesia in Esophageal Surgery. A. R. Wilkins.—p. 274.
Crawford Williamson Long, 1815-1878. T. J. Collier.—p. 279.
Tetrachlorethylene as Anesthetic Agent. Ellen B. Foot, K. Bishop and Virginia Apgar.—p. 283.
Clinical Aspects of Pulmonary Atelectasis (with Case Report of Death Under Anesthesia). S. Schotz.—p. 293.

Annals of Internal Medicine, Lancaster, Pa.

18:445-718 (April) 1943

Scientific Proof and Relations of Law and Medicine. H. W. Smith.—p. 450.
Clinical Approach to Alleged Traumatic Disease. L. Brahdy and S. Kahn.—p. 491.
Problems of Proof in Claims for Recovery for Dermatitis. L. Schwartz.—p. 500.
Circulatory Deficiency in Extremities in Relation to Medicolegal Problems: Arteriosclerotic Deficiency (Including Diabetes); Thromboangiitis Obliterans, or Buerger's Disease. J. Homans.—p. 518.
Medical Facts That Can or Cannot Be Proved by Roentgen Ray: Historical Review and Present Possibilities. S. W. Donaldson.—p. 535.
Criminal Interrogation with Lie Detector: Eight Years' Experience by Michigan State Police. L. M. Snyder.—p. 551.
Legal Medical Aspects of Blood Tests to Determine Intoxication. M. Ladd and R. B. Gibson.—p. 564.
Certain Medical and Legal Phases of Eugenic Sterilization. A. Myerson.—p. 580.
Medical and Social Factors in Crime. A. W. Stearns.—p. 599.
Privileged Communications: Is Justice Served or Obstructed by Closing the Doctor's Mouth on Witness Stand? Z. Chafee Jr.—p. 606.
Contracts Not to Practice Medicine. E. M. Dodd Jr.—p. 618.
Tort Liability of Hospitals. A. W. Scott.—p. 630.
Compulsory Vaccination and Sterilization. T. R. Powell.—p. 637.
The Doctor's Federal Taxes. E. N. Griswold.—p. 647.
Traumatic Psychoses. F. G. Ebaugh and H. W. Brosin.—p. 666.

Archives of Neurology and Psychiatry, Chicago

49:641-792 (May) 1943

Studies in Diseases of Muscle: XII. Heredity of Progressive Muscular Dystrophy: Relationship Between Age at Onset of Symptoms and Clinical Course. A. T. Milhorat and H. G. Wolff.—p. 641.
Id.: XIII. Progressive Muscular Dystrophy of Atrophic Distal Type; Report on Family; Report of Autopsy. A. T. Milhorat and H. G. Wolff.—p. 655.
Experiences with Intramedullary Tractotomy: II. Immediate and Late Neurologic Complications. L. M. Weinberger and F. C. Grant.—p. 665.
Spinal Necrosis and Softening of Obscure Origin: Necrotic Myelitis versus Myelomalacia; Review of Literature and Clinicopathologic Case Studies. D. Jaffe and W. Freeman.—p. 683.
Inclusion Bodies and Late Fate of Ganglion Cells in Infantile Amaurotic Family Idiocy. O. Marburg.—p. 708.
Fatal Cerebrovascular Accident Associated with Catatonic Schizophrenia: Report of Case. J. P. Murphy and M. A. Neumann.—p. 724.
Dr. H. Douglas Singer's Concept of Psychoses. Irene C. Sherman and S. B. Broder.—p. 732.
Pathways for Pain from Stomach of Dog. O. J. Balchum and H. M. Weaver.—p. 739.
Formation of Demyelinated Plaques Associated with Cerebral Fat Embolism in Man: I. Mark Scheinker.—p. 754.
Occlusion of Anterior Inferior Cerebellar Artery. R. D. Adams.—p. 765.

Archives of Ophthalmology, Chicago

29:699-872 (May) 1943

*Anticoagulant Therapy of Occlusion of Central Vein of Retina in Relation to Pathogenesis and Differential Diagnosis. Bertha A. Klien.—p. 699.
Iontophoretic Introduction of Atropine and Scopolamine into Rabbit Eye. L. von Sallmann.—p. 711.
Objective Strabismometry in Young Children. M. C. Wheeler.—p. 720.
Precancerous Melanosis and Resulting Malignant Melanoma (Cancerous Melanosis) of Conjunctiva and Skin of Lids. A. B. Reese.—p. 737.
Weather and Ocular Pathophysiology. W. F. Petersen.—p. 747.
Local Therapy of Catarrhal Conjunctivitis with Sulfonamide Compounds. P. Thygeson and A. E. Braley.—p. 760.
Congenital Absence of Lacrimal Puncta in Three Members of Family. A. E. Town.—p. 767.
Practical Application of Crossed Prisms. L. Bacon.—p. 772.
Correction of Low Astigmatism: Subtraction Test. S. J. Beach.—p. 775.
Principles of Tonometer Standardization. E. Sachs and Frances L. MacCraken.—p. 782.
Degeneration and Repair of Rat Retina in Avitaminosis A. Myra L. Johnson.—p. 793.
Studies with Microcrystalline Sulfathiazole. I. H. Leopold and H. G. Scheie.—p. 811.
Optochiasmic Arachnoiditis: Report of 3 Cases. E. R. Ryan.—p. 818.
Pigmentation of Optic Disk. D. Kravitz.—p. 826.
Ophthalmic Requirements of Military Services. C. A. Bahn.—p. 831.

Anticoagulant Therapy of Occlusion of Central Vein of Retina.—Klien differentiates the following four types of occlusion of the central retinal vein: 1. Occlusion by compression from without the vessel and secondary thrombus formation, as in some types of arteriosclerosis and phlebosclerosis or in tumor metastasis into the optic nerve. In these conditions anticoagulant therapy is of little or no value, as thrombus formation is only the terminal event bringing about complete occlusion of an already narrow venous aperture. 2. Occlusion by primary thrombus formation in blood dyscrasias, such as polycythemia and thrombocythemia. Heparin or dicumarol therapy is of definite value. The rapid action of these preparations may be prolonged and supported later, if necessary, by roentgen irradiation of the bone marrow. 3. Occlusion by stagnation thrombosis following widespread arterial spasms. To this type belongs venous occlusion caused by (*a*) early spastic hypertension, (*b*) a surgical procedure or cranial fracture and (*c*) congenital heart disease. Anticoagulants, perhaps supported by vasodilators, should be of definite value in the treatment of this type. 4. Occlusion by inflammatory disease of the venous wall and secondary thrombus formation. The employment of anticoagulants is contraindicated. Heparin and dicumarol are valuable additions to the therapeutic armamentarium for the care of eyes with venous occlusion whose vision otherwise might be lost, but the most accurate clinical classification of the type of occlusion should precede the employment of this therapy.

Archives of Pathology, Chicago

35:649-786 (May) 1943

*Cortical Necrosis of Adrenal Glands Associated with Addison's Disease: Report of 8 Cases. J. D. Duffin.—p. 649.
Studies of Normal and of Abnormal Mitotic Activity: II. Rate and Periodicity of Mitotic Activity of Experimental Epidermoid Carcinoma in Mice. C. M. Blumenfeld.—p. 667.
Tuberculoid Reaction in Ovarian Dysgerminoma. E. L. Heller.—p. 674.
Postmortem Study of Renal Pelvis in Relation to Hypertension. B. E. Stofer and L. L. Kline.—p. 681.
Tyrosine Poisoning in Rats. W. C. Hueper and G. J. Martin.—p. 685.
Effects of Repeated Intravenous Injections of Lecithin in Rabbits: Relationships to Lipoid Storage Diseases and to Hemolytic Anemias. Edna H. Tompkins.—p. 695.
Influence of Vitamin B_6 and Pantothenic Acid on Growth of Sarcoma 180. F. Bischoff, Louise P. Ingraham and J. J. Rupp.—p. 713.
Anomalies of Aortic Arch. P. A. Herbut.—p. 717.

Cortical Necrosis of Adrenal Glands Associated with Addison's Disease.—Duffin states that Addison's disease is caused by a tuberculous destruction of the adrenal glands in the majority of cases. There are, however, cases in which the process is not tuberculous. They are referred to as cases of adrenal atrophy. Relatively few such cases have been recorded in detail. The author reports 8 cases and points out the remarkable similarity in their symptoms and course. Six of the patients were women; the youngest was 20 and the oldest 44 at the time of death. All presented a gradually developing and slowly progressing asthenia interspersed with attacks of prostration and vomiting. All had some degree of hypotension and pigmentation. All died in an addisonian crisis between

two and four years after the onset of symptoms. The lesions observed in the adrenal glands presented the same striking similarity as did the clinical course. In 6 cases the lesion was one of cortical destruction with severe and widespread necrosis of the cortex in 4 and complete disappearance of cortical tissue in 2. In each case the adrenal medulla was comparatively well preserved but constantly showed lymphocytic infiltration. In 2 additional cases no adrenal parenchymal tissue remained, although the process was presumed to be of the same nature as that in the other 6. The thyroid was atrophic, fibrosed and infiltrated with lymphocytes. The pituitary gland in 3 of the 4 cases examined showed a diffuse increase in the connective tissue of the anterior lobe, a scarcity of basophils and a reduction in eosinophilic and chromophobe cells. A hitherto unrecorded pigmentation of fat tissue was noted. The process in the adrenal glands is not one of true atrophy but rather of a disappearance of tissue secondary to cortical necrosis. No clue as to the cause of the cortical necrosis was obtained. The incidence of this pathologic process in the present series of cases of Addison's disease was 41 per cent.

Archives of Surgery, Chicago

46:459-588 (April) 1943

Effects of Jejunal Transplants on Experimental Production of Peptic Ulcers. J. W. Lord Jr., W. DeW. Andrus and P. Stefko.—p. 459.
Hemangioma of Joints. M. C. Cobey.—p. 465.
*Post-Traumatic Dystrophy of Extremities: Chronic Vasodilator Mechanism. G. de Takats and D. S. Miller.—p. 469.
Solitary Benign Enchondroma of Bone. H. L. Jaffe and L. Lichtenstein. —p. 480.
Primary Carcinoma of Infra-Ampullary Portion of Duodenum with Example of Probable Origin from Aberrant Pancreatic Tissue. G. L. Duff, H. L. Foster and W. W. Bryan.—p. 494.
Therapeutic Trends and Operative Mortality in Cases of Obstructive Jaundice. A. W. Ulin.—p. 504.
Infiltration of Bone with Spontaneous Fracture in Case of Chronic Myelogenous Leukemia. L. M. Meyer, A. B. Friedmann and V. Ginsberg.—p. 514.
*Arteriosclerotic Gangrene: Report on Refrigeration Prior to Amputation. E. R. Haley.—p. 518.
Nerve Regeneration in Rat Following Tubular Splicing of Severed Nerves. P. Weiss.—p. 525.
Role of Toxin and Use of Antitoxin in Systemic Staphylococcic Infections. B. Kleiger and J. E. Blair.—p. 548.
Trigeminal Neuralgia Due to Radicular Lesions. W. B. Hamby.—p. 555.
Biliary Dyskinesia: Role Played by Remnant of Cystic Duct. H. K. Gray and W. S. Sharpe.—p. 564.
Reticulocytosis Following Ablation of Frontal Cerebral Cortex. F. A. Mettler.—p. 572.
Repair of Large Cranial Defects: Report of Case in Which Large Cranial Defect Was Repaired by Graft from Ilium. V. S. Lambros. —p. 575.
Evaluation of Blood Test for Galactose Tolerance in Diagnosis of Hyperthyroidism. N. G. Schneeberg, W. B. Likoff and D. R. Meranze. —p. 581.

Post-Traumatic Dystrophy of Extremities.—De Takats and Miller describe observations on the syndrome of Sudeck's atrophy. Many terms have been employed to characterize it, such as traumatic angiospasm, chronic traumatic edema, acute atrophy of bone, post-traumatic osteoporosis, peripheral trophoneurosis and reflex nervous dystrophy. The authors studied and treated 33 cases; in 12 plethysmographic studies the blood flow, vasomotor reactivity and calcium metabolism were investigated. They gained the impression that Sudeck's atrophy is the result of a chronic stimulation of somatic and possibly of efferent vasodilator fibers. Pain, localized and spreading, vasodilatation and osteoporosis characterize the fully developed syndrome, but osteoporosis is a late manifestation. Reflex dystrophy is most amenable to treatment in the early stages; later it becomes more intractable and requires more radical interventions. The eliciting trauma is usually a blunt injury near a joint or a nerve trunk, such as the interosseus, the saphenous or the posterior tibial nerve. The treatment must fit the duration and severity. It consists in repeated injections of procaine hydrochloride into the injured area, paravertebral sympathetic block, periarterial sympathectomy and sympathetic ganglionectomy. Orthopedic correction may be needed in cases of advanced atrophy after the pain has subsided.

Refrigeration Prior to Amputation in Arteriosclerotic Gangrene.—According to Haley, twenty amputations for arteriosclerotic gangrene have been performed in a six month period at his hospital. Seven of these were performed under spinal anesthesia, 3 under intravenous pentothal sodium anesthesia and 10 with the employment of the ice-tourniquet anesthesia. The ice-tourniquet treatment has a place as a preoperative measure in the management of debilitated patients with gangrene. Operative or postoperative reactions following the use of this method are mild as compared with those following the use of spinal anesthesia. The need for preoperative and postoperative sedation is practically eliminated. The stump is apparently not harmed by the ice-tourniquet, and healing is satisfactory. The use of two tourniquets with amputation between them constitutes an improvement over the use of one tourniquet.

Bulletin of Johns Hopkins Hospital, Baltimore

72:203-254 (April) 1943

Studies in Experimental Hypertension: I. Phenol Red Excretion and Renal Blood Flow in Hypertension of Renal Origin. T. A. Warthin and Caroline B. Thomas.—p. 203.
*Role of Alpha Hemolytic Streptococcus in Pneumonia. H. M. Thomas Jr.—p. 218.
Renal Osteomalacia and Osteitis Fibrosa in Adults. R. H. Follis Jr. and Deborah A. Jackson.—p. 232.
Salt, Carbohydrate and Water Appetite of Adrenalectomized Rats Before and After Treatment with Desoxycorticosterone Pellets. J. Mark.— p. 243.
Note on Fate of Injected Insulin. J. Mark and R. C. Lewis Jr.—p. 246.

Alpha Hemolytic Streptococcus in Pneumonia.—Thomas discusses 2 fatal cases of primary atypical bronchopneumonia. In 1 Streptococcus viridans was recovered from the sputum and from the blood stream during life. In the other the organism was recovered from the sputum during life and from the heart's blood and bronchial exudate at autopsy shortly after death. The presence of Streptococcus viridans in cases of influenzal pneumonia and primary atypical bronchopneumonia has been noted previously, but its importance has been discounted. The observations reported here suggest that this organism is capable of playing a pathogenic role as a secondary invader. In view of its well recognized pathogenic activity in the production of endocarditis, its presence in the bronchi in association with purulent inflammation may be of more significance than is at present recognized. Intense purulent bronchiolitis, by causing obstruction of the air passages, is an added factor in the symptomatology and outcome of atypical bronchopneumonia, and Streptococcus viridans appears to be one of a variety of organisms which may produce this complication.

Bulletin New York Academy of Medicine, New York

19:301-370 (May) 1943

Multiple Sclerosis and "Encephalomyelitis." T. J. Putnam.—p. 301.
Management of Hypertension. W. Goldring.—p. 317.
Pulmonary Irritants. R. A. Kehoe.—p. 340.
Effect of War Gases and Other Chemicals on Eyes of Civilian Population. C. Berens and E. Hartmann.—p. 356.

Diseases of Chest, Chicago

9:197-296 (May-June) 1943

Common Masquerading Lung Disease. R. H. Overholt.—p. 197.
*Coexistence of Pathogenic Fungi in Certain Chronic Pulmonary Diseases, with Especial Reference to Pulmonary Tuberculosis (Preliminary Report). A. E. Greer and H. N. Gemoets.—p. 212.
Study of Weltmann Coagulation Reaction in Pulmonary Tuberculosis. W. I. Werner.—p. 241.
Chemotherapy of Tuberculosis F. Seligson.—p. 245.
World Planning for Tuberculosis Control. C. M. Hendricks.—p. 257.
Tuberculosis Problem in Army. C. C. Hillman.—p. 265.
Photofluorographic Chest Survey of Naval Personnel. R. E. Duncan. —p. 269.
Tuberculosis Problem in Veterans Administration. R. A. Wolford. —p. 274.
Tuberculosis Control Program of U. S. Public Health Service. H. E. Hilleboe.—p. 281.
Relationship Between National Research Council and Medical Services. E. R. Long.—p. 284.

Coexistence of Pathogenic Fungi in Pulmonary Tuberculosis.—Greer and Gemoets investigated the incidence of fungi in the oral sputum of 301 patients of the Houston Tuberculosis Hospital. Fungi were isolated from the oral sputum by direct smear and by culture on Sabouraud's dextrose medium in 45 (15 per cent) of 301 patients; in 18 patients (6 per cent) fungi individually identical with the ones found in sputum were isolated by carefully controlled washing of the trachea. Intensive study of these 18 patients revealed that parasitic fungi may

be found in the tracheal sputum of at least 4 per cent of tuberculous patients and that the finding of fungi in the oral sputum alone does not assure their presence also in the trachea and, therefore, by inference, in the bronchi and lungs. In 60 per cent of the patients who have fungi only in the oral sputum, the fungi are harmless saprophytic contaminants. Fungi obtained from the trachea and cultured on Sabouraud's dextrose medium will produce, when injected into the lungs of rabbits, localized and generalized pulmonary lesions from which the same fungi may be obtained. Pulmonary tuberculosis seems to have a more devastating course when it is associated with parasitic fungi. The coexistence of fungous and tuberculous infections should be more frequently considered in the diagnosis of chronic pulmonary diseases.

Endocrinology, Springfield, Ill.

32:307-372 (April) 1943

Studies on New Series of Synthetic Estrogenic Substances. E. W. Blanchard, A. H. Stuart and R. C. Tallman.—p. 307.
Effect of Adrenal Cortical Compounds on Edema Formation of Frogs' Hind Limbs. C. Hyman and R. Chambers.—p. 310.
Urinary Steroids from Breast Cancer Patients. B. R. Hill and B. B. Longwell.—p. 319.
Relation of B Vitamins to Ovarian Function During Experimental Hyperthyroidism. V. A. Drill, R. Overman and J. H. Leathem. —p. 327.
Mitotic Activity in Anterior Hypophysis of Female Rats of Different Age Groups and at Different Periods of Day. T. E. Hunt.—p. 334.
Adrenal Functions in Opossum. F. A. Hartman, D. E. Smith and L. A. Lewis.—p. 340.
Inactivation of Endogenous Androgens by Liver in Rabbits. B. Krichesky, J. A. Benjamin and C. Slater.—p. 345.
Effects in Dog of Infusion of Adrenal Cortical Extract on Exercise Tolerance, Blood Constituents and Adrenal Cortex. G. H. Ettinger and Doreen Jeffs.—p. 351.
Estimation of Size of Comb on Live Fowl. D. G. Jones and W. F. Lamoreux.—p. 356.
Effect of Autolysis on Differential Solubility of Principles of Posterior Lobe of Pituitary Body. J. A. Vaichulis.—p. 361.

Experimental Medicine and Surgery, Brooklyn

1:105-228 (May) 1943

Initiation of Ventricular Fibrillation Due to Coronary Occlusion. A. S. Harris and A. Guevara Rojas.—p. 105.
Effect of Subcutaneous Injection of Individual Amino Acids on the Appearance, Growth and Disappearance of Emge Sarcoma in Rats. H. H. Beard.—p. 123.
Effect of Administering Individual Amino Acids and Casein Hydrolysate on Appearance, Growth and Disappearance of Emge Sarcoma in Rats. H. H. Beard.—p. 136.
Elective Painless Rapid Childbirth Anticipating Labor. H. Koster and L. Perrotta.—p. 143.
Graphic Study of Auscultatory Blood Pressure Measurement. F. M. Groedel and M. Miller.—p. 148.
Methodical Advice for Dissection of Cava Funnel Region in Cases of Pericardial Diseases. H. Elias.—p. 163.
New Method to Produce a Nystagmus. B. Kisch.—p. 169.
Dependency of Anion on Associated Cation in the Distribution and Excretion of Halides in Body. W. L. Lipschitz.—p. 171.
Tissue Action of Theophylline and Other Xanthines. E. R. Zak.—p. 181. —p. 181.

Georgia Medical Association Journal, Atlanta

32:95-150 (April) 1943

Functional Disorders of Circulation. H. C. Sauls, C. Smith and C. F. Stone.—p. 95.
Renal Hypertension. W. Harbin Jr.—p. 99.
Withdrawal of Physicians in Private Practice from Georgia. A. Ciocco and I. Altman.—p. 104.
Facts About Rabies for the Physician. E. J. Sunkes and T. F. Sellers. —p. 110.
Relief of Pain by Neurosurgical Measures. H. S. Swanson.—p. 146.

Hawaii Medical Journal, Honolulu

2:131-184 (Jan.-Feb.) 1943

Leptospirosis (Weil's Disease). R. J. Hoagland, F. H. Harris and S. S. Chinen.—p. 131.
Survey of Leptospirosis in Honolulu. J. E. Alicata and Virginia Breaks.—p. 137.
Treatment of Bronchiectasis: I. Discussion and Report of Case. S. E. Doolittle.—p. 143.
Id.: II. Review of Literature and Discussion of Surgical Technic. J. E. Strode.—p. 146.
Social Aspects of Maternity Care: Study of 203 Cases Under Care at Queen's Hospital. Virginia Chatfield Ott.—p. 149.
Corpus Luteum Cyst in Ovarian Transplant. L. G. Phillips.—p. 154.

Illinois Medical Journal, Chicago

83:289-364 (May) 1943

Treatment of Shock from War Wounds. H. N. Harkins.—p. 325.
Recognition and Treatment of Surgical Shock. A. M. Vaughn and M. J. McCarthy.—p. 331.
Treatment of Mental Disorders by Electrically Induced Convulsions: Preliminary Report. E. Otten.—p. 336.
Orchiectomy in Prostatic Cancer: Case Report. P. H. Pernworth. —p. 338.
Prognostic Factors in Cases of Psychoses Following Pregnancy. Ethel A. Chapman.—p. 339.

Journal of Bone and Joint Surgery, Boston

25:243-502 (April) 1943. **Partial Index**

Avascular Necrosis of Bone. J. F. Brailsford.—p. 249.
Tangential Osteochondral Fracture of Patella. J. E. Milgram.—p. 271.
Subtrochanteric Osteotomy for Pelvic Support. J. Hass.—p. 281.
Metastatic Malignancy of Spine. J. W. Toumey.—p. 292.
Cystic Myxomatous Tumors About Knee: Their Relation to Cysts of Menisci. R. K. Ghormley and M. B. Dockerty.—p. 306.
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Bridging of Vertebral Bodies in Tuberculosis of Spine. R. Perlman and J. A. Freiberg.—p. 340.
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Treatment of Complete Permanent Acromioclavicular Dislocation by Surgical Arthrodesis. G. D. Caldwell.—p. 368.
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Delayed Union and Nonunion: Ninety Per Cent Preventable. R. Anderson and E. Burgess.—p. 427.
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Disseminated (Miliary) Tuberculosis of Bone with Multiple Localizations in Skeleton: Report of 2 Proved Cases. J. Lyford.—p. 453.
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Journal of Clinical Investigation, Boston

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*Nitrogen Retention, Creatinuria, and Other Effects of Treatment of Simmonds' Disease with Methyl Testosterone. S. C. Werner and R. West.—p. 335.
Motility of Small Intestine in Sprue. F. J. Ingelfinger and R. E. Moss. —p. 345.
Investigations of Meningococcic Infection: I. Bacteriologic Aspects. L. Thomas and J. H. Dingle.—p. 353.
Renal Biopsy Studies Correlated with Renal Clearance Observations in Hypertensive Patients Treated by Radical Sympathectomy. J. H. Talbott, B. Castleman, R. H. Smithwick, R. S. Melville and L. J. Pecora.—p. 387.
Group A Hemolytic Streptococcus Antibodies: I. Griffith Type Agglutinin and Antistreptolysin Titers in Normal Men and in Acute Infections. L. A. Rantz, W. M. M. Kirby and A. H. Jacobs.—p. 411.
*Absorption, Excretion and Distribution of Penicillin. C. H. Rammelkamp and C. S. Keefer.—p. 425.
Changes Which Alter Renal Osmotic Work. J. D. Newburgh.—p. 439.
Diodrast and Insulin Clearances in Nephrotic Children with Supernormal Urea Clearances. K. Emerson Jr. and V. P. Dole.—p. 447.
Observations on Physiology and Biochemistry of Quantitative Burns. W. W. L. Glenn, J. Muus and C. K. Drinker.—p. 451.
Improvements in Calculation of Renal Resistance to Blood Flow: Charts for Osmotic Pressure and Viscosity of Blood. H. Lamport.—p. 461.

Methyl Testosterone for Simmonds' Disease.—Werner and West point out that the loss of nitrogen after hypophysectomy in experimental animals is clinically reflected in Simmonds' disease; but, whereas in animals replacement therapy is readily accomplished with anterior hypophysial substance, this is not always the case in Simmonds' disease. Administration of methyl testosterone in dwarfism results in nitrogen retention and creatinuria. The authors obtained striking subjective, objective and laboratory changes with methyl testosterone therapy in 4 patients with Simmonds' disease. The patients demonstrated renewed vigor, sense of strength and libido, and redeveloped secondary sex characteristics. Seborrhea failed to appear, suggesting that androgens act to produce seborrhea only after the skin has been prepared by some basic mechanism or mechanisms which are wanting following hypophysial failure. In the absence of hypophysial function, administration of methyl testosterone resulted in nitrogen retention associated with persistent weight gain. Definite creatinuria developed after a latent

period of several weeks and subsided in about the same length of time after discontinuance of treatment. The therapeutic value of methyl testosterone in Simmonds' disease or anterior pituitary insufficiency is suggested by these cases.

Absorption, Excretion and Distribution of Penicillin.—Rammelkamp and Keefer studied the absorption, excretion and distribution of penicillin when administered by various routes. The subjects included normal volunteers and ward patients. Penicillin in the form of the sodium salt was dissolved in either distilled water or 0.85 per cent sodium chloride solution and passed through a Seitz filter to effect sterilization. The final concentration of all solutions was 1,000 Florey units per cubic centimeter except that administered subcutaneously, which contained 200 Florey units per cubic centimeter of 0.85 per cent sodium chloride. The number of Florey units administered varied between 5,000 and 40,000. Intravenous injection of penicillin resulted in high initial concentration in the blood plasma followed by an abrupt fall. The sharp fall in the serum concentration was associated with increased excretion in the urine. Penicillin was rapidly absorbed when given intramuscularly and slowly absorbed after subcutaneous injections. Excretion in the urine was rapid following intramuscular injections and delayed after subcutaneous injections. Absorption from the body cavities was delayed, and this was reflected in the slow excretion of penicillin by the kidneys. The total amount found in the urine was somewhat lower than that obtained after intravenous injection. Fluid aspirated from pleural and joint cavities twenty-two and thirteen hours after injection showed appreciable amounts of penicillin remaining. Absorption of penicillin from the duodenum was rapid, whereas oral and rectal doses were poorly absorbed. This may be explained by the inactivating effect on penicillin of the acid and of Escherichia coli. The average amount excreted in the urine after oral, intraduodenal and rectal administration was extremely small. Penicillin was not excreted rapidly in renal failure and, as a result, high concentrations were maintained in the blood stream after intravenous injections. Penicillin failed to penetrate the red cells in significant amounts. The average concentration in erythrocytes was less than 10 per cent of the plasma concentration. No penicillin was found in the spinal fluid, saliva or tears of subjects receiving it intravenously.

Journal of Experimental Medicine, New York

77:397-486 (May) 1943

Biochemical Studies on Shock: I. Metabolism of Amino Acids and Carbohydrate During Hemorrhagic Shock in Rat. F. L. Engel, Mary G. Winton and C. N. H. Long.—p. 397.

Further Studies on Survival and Development in Vitro of Malaria Parasite. W. Trager.—p. 411.

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Antigenic Relationship of British Swine Influenza Strains to Standard Human and Swine Influenza Viruses: Use of Chicken and Ferret Antiserums in Red Cell Agglutination. N. P. Hudson, M. M. Sigel and F. S. Markham.—p. 467.

Changes in Lipid Content of Serum and of Liver Following Bilateral Renal Ablation or Ureteral Ligation. A. W. Winkler, S. H. Durlacher, H. E. Hoff and E. B. Man.—p. 473.

Journal Industrial Hygiene & Toxicology, Baltimore

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New Method for Determination of Free Silica in Industrial Dust. A. Salazar and L. Silverman.—p. 139.

Study of Industrial Workers Exposed to Sulfur Dust. S. S. Pinto, R. A. Brown and B. H. Carlton.—p. 149.

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Journal of Lab. and Clinical Medicine, St. Louis

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Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinuria: Case Report with Experimental Studies. B. J. Hoffman and R. R. Kracke.—p. 817.

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Relation Between Amounts of Pertussis Antigen Injected and Production of Agglutinins. J. A. Toomey, W. S. Takacs, R. Averill and N. Lewis.—p. 835.

Experimental Study of Phlebitis Following Venoclysis with Glucose and Amino Acid Solutions. A. Horvitz, L. A. Sachar and R. Elman.—p. 842.

Erythrocyte Longevity in Dogs and Rabbits. J. E. Davis.—p. 848.

Effect of Change of Altitude on Basal Metabolism of Human Subjects. R. C. Lewis, Alberta Iliff, Anna Marie Duval and Gladys M. Kinsman.—p. 851.

Effect of Change of Altitude on Blood of Human Subjects. R. C. Lewis, Alberta Iliff, Anna Marie Duval and Gladys M. Kinsman.—p. 860.

Journal Neuropath. and Exper. Neurology, Baltimore

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Diencephalon and Telencephalon in Human Case of Cyclopia and Arhinia. F. A. Mettler and O. Marburg.—p. 111.

Action of Metrazol on Motor and Sensory Nuclei of Brain Stem. C. Gutierrez-Noriega.—p. 132.

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Combined Staining Method for Neurologic Tissue. W. B. Dublin.—p. 205.

Journal of Nutrition, Philadelphia

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Ascorbic Acid Nutrition of Some College Students. Alemda P. Brown, Margaret L. Fincke, Jessie E. Richardson, E. N. Todhunter and Ella Woods.—p. 411.

Biological Determination of Vitamin E. H. Gottlieb, F. W. Quackenbush and H. Steenbock.—p. 433.

Choline Content of Animal and Plant Products. R. W. Engel.—p. 441.

Value of Dairy Products in Nutrition: III. Riboflavin, Pantothenic Acid, Nicotinic Acid and Biotin Content of Several Varieties of Cheese. R. A. Sullivan, Evelyn Bloom and Joan Jarmol.—p. 463.

Effect of Aromatic Hydrocarbons on Growth. Reversible Inhibition of Pantothenic Acid by Sulfapyridine. H. D. West, N. C. Jefferson and R. E. Rivera.—p. 471.

Effect of Dietary Fat on Bone Calcification in Growing Rat. R. Bunkfeldt and H. Steenbock.—p. 479.

Ascorbic Acid Deficiency Among Papago Indians. M. Pijoan, C. A. Elkin and C. O. Eslinger.—p. 491.

Growth in Mice Fed Diets Rendered Deficient in Cystine but Not in Methionine. C. D. Bauer and C. P. Berg.—p. 497.

*Influence of Variety, Size and Degree of Ripeness on Ascorbic Acid Content of Peaches. G. M. Schroder, G. H. Satterfield and A. D. Holmes.—p. 503.

Ascorbic Acid Content of Peaches.—Schroder and others made a study of the ascorbic acid content of eight common varieties of peaches grown under comparable climatic and soil conditions in commercial orchards near Raleigh, N. C. The larger portion of the 156 peaches studied were obtained directly from orchards and were assayed within two days of their arrival. There was no correlation between the size of the peach and its ascorbic acid content. The average difference in ascorbic acid content of peaches within varieties was 4.29 mg. per hundred grams of fruit, whereas the extreme difference between varieties was 9.02 mg. per hundred grams of fruit. The concentration of ascorbic acid in peaches was found to be highest in the skin, lower in the flesh directly under the skin and lowest in the flesh surrounding the pit. Hard peaches con-

tained the minimum of ascorbic acid, and as the peaches ripened the amount increased to a maximum for the fully ripe edible peach. The average ascorbic acid content of ripe peaches varied from 3.84 mg. per hundred grams for the Augbert to 12.86 mg. per hundred grams for the Hiley Belle variety. The ascorbic acid content of peaches is not as high as that of lemons, oranges or tomatoes, but fully ripe peaches contain sufficient ascorbic acid to contribute materially to the human requirements for this vitamin.

Journal of Pediatrics, St. Louis

22:513-636 (May) 1943

*Evaluation of Dangers of Repeated Administration of Sulfadiazine and Sulfathiazole in Children. H. W. Fink and J. L. Wilson.—p. 513.
Menarcheal Age and Height, Weight and Skeletal Age of Girls Age 7 to 17 Years. Katherine Simmons and W. W. Greulich.—p. 518.
Study of Humoral Antibodies for Staphylococcus Aureus in Infants and Their Mothers. J. A. Lichty Jr., C. P. Katsampes and W. S. Baum.—p. 549.
Disturbed Kidney Function in Newborn Infant Associated with Decreased Calcium: Phosphorus Ratio. C. E. Snelling.—p. 559.
Finger Puncture Method for Sedimentation Rate. A. Weisz and L. M. Taran.—p. 565.
*Sporadic Congenital Obstructive Goiter with Recovery Following Operation in Thirteen Day Old Infant. J. R. Davies.—p. 570.
Familial Epidemiology of Rheumatic Fever Genetic and Epidemiologic Studies: II. Epidemiologic Studies. May G. Wilson, M. D. Schweitzer and Rose Lubschez.—p. 581.

Repeated Administration of Sulfonamides in Children.—Fink and Wilson investigated the incidence of acquired sensitivity to sulfadiazine and sulfathiazole in 177 children who were given a sulfonamide drug in two or more courses and had no reaction during the first course. Of the 86 who were given sulfathiazole 3 developed febrile reactions, and of the 91 who were given sulfadiazine 4 developed febrile reactions. It is suggested that these febrile responses were toxic reactions to the drug that might have occurred at any time and had no clear relation to previous drug therapy. Two of the 7 children with initial reactions were given a second and a third course of the drug without reaction. An "immediate" type of febrile reaction occurred during a second course of sulfonamide in 3 of 5 children who had had reactions during a first course. These studies showed that "sensitization" to sulfathiazole or sulfadiazine is not common or frequent in children but that the occurrence of one reaction greatly increases the probability of future reactions. The authors suggest that children who develop toxic symptoms during the first administration of the drug should be given the drug only with caution and under close observation.

Congenital Goiter in Infant with Recovery Following Operation.—Davies presents the history of a woman who gave birth to 7 children, 5 of whom are alive. The first three were normal full term males and are now 11, 10 and 7 years of age respectively. The mother has had severe attacks of asthma since 1934. She administers to herself injections of epinephrine during these attacks. She has a centrally placed thyroid swelling of small to medium size which appears to be adenomatous in character. At the birth of the fourth child the mother was acutely distressed with an attack of asthma, and epinephrine had to be given. The infant was dyspneic and cyanotic. A large bilateral mass connected by a smaller central mass occupied the greater part of the anterior neck. This child died on the thirteenth day. The postmortem diagnosis was congenital hyperplasia and hypertrophy of the thyroid. The fifth child died when 27 days old. The case of this child resembled that of the preceding one, although the swelling in the neck was unilateral. The sixth child, a girl, presented no enlargement in the neck at birth and is normal at the age of 2. The seventh child, a boy, was born on Nov. 22, 1941 with a large bilateral mass in the neck. One-third grain (0.02 Gm.) of sodium iodide in aqueous solution was given by mouth once a day, beginning on the third day of life. Four days later the swelling in the neck appeared to be enlarging. On December 4 thyroidectomy was performed because of cyanosis and stridor. Two minims (0.12 cc.) of strong solution of iodine was given daily for the next twelve days. There is no evidence of thyroid disturbance several months after the operation.

Kentucky Medical Journal, Bowling Green

41:145-184 (May) 1943

Medical Research in the Navy. H. W. Smith.—p. 148.
Relationship Between Local Board Examining Physician and Registrant with Reference to Initial Examination. J. L. Toll.—p. 154.
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Army Examination and Induction Routine. J. E. Dittmer.—p. 161.
Processing at Reception Center. R. C. Alley.—p. 164.
Hypertension. R. G. Webb.—p. 166.
Deafness and Its Detection. A. J. DiCello.—p. 168.
Influenzal Meningitis: Report of Case. E. P. Scott.—p. 172.
Spinal Anesthesia with Pontocaine. S. S. Clark.—p. 174.
Skin Grafting. A. B. Ortner.—p. 176.
Ambulatory Treatment of Sacroiliac Disease. C. Bailey.—p. 179.

Maine Medical Association Journal, Portland

34:63-80 (April) 1943

Significance of Rh Factor of Blood. J. E. Porter.—p. 63.
The Doctor of Medicine and His Responsibility. A. W. Adson.—p. 66.

34:81-102 (May) 1943

Five Hundred Neuropsychiatric Casualties at Naval Hospital. A. W. Stearns and R. S. Schwab.—p. 81.
Use of Sulfa Drugs in Traumatic Surgery. F. Winchenbach.—p. 90.

Medical Annals of District of Columbia, Washington

12:171-212 (May) 1943

*"Primary Atypical Pneumonia": Report Based on Study of 250 Cases. J. L. Thompson Jr.—p. 171.
*Treatment of Infections of Cervix, Vagina and Vulva with an Allantoin-Sulfanilamide-Lactose Ointment: Preliminary Report. J. Parks.—p. 175.
Anuria Caused by Transfusion Reactions Due to Anti Rh Agglutinins in Pregnant Women: Report of 2 Cases. W. M. Yater and B. E. Nunez.—p. 178.
Psychiatric Program at National Training School for Boys. L. M. Dub.—p. 185.

Primary Atypical Pneumonia.—Thompson's report deals with 250 cases of a syndrome which has been variously termed "acute diffuse bronchitis," "acute interstitial pneumonitis," "acute pneumonitis," "virus pneumonia," "primary atypical pneumonia" and the like. The pneumonitis is mainly interstitial. The criteria for diagnosis are a history of "grippy" sensations, minimal physical signs, x-ray findings, normal or leukopenic white blood cell response, irregular fever resolving by lysis, relative bradycardia, sputum negative for pneumococci and no response to sulfonamide therapy. The etiologic agent may be one of several viruses, and the clinical signs and symptoms form a bizarre pattern. A definite diagnosis can be made through totaling several factors and not by a single observation or procedure. Exclusion of closely simulated diseases, particularly of pneumococcic pneumonia, is paramount. There is no alternative but to give a sulfonamide routinely until a definite diagnosis of primary atypical pneumonia can be made. This routine therapy at the onset of the disease might have some beneficial effect on possible secondary bacterial invasion. Symptomatic treatment is all that can be offered in primary atypical pneumonia. The symptoms that demand greatest attention are the headache and the dry, hacking cough. These are alleviated by codeine and by steam inhalations. Oxygen therapy is rarely necessary. The author kept each patient at bed rest until there had been six days of normal temperature or until the x-ray film showed clearing. Seven to fourteen days of fever, six days of normal temperature, seven days sitting up and seven days of moderate activity resulted in an average hospitalization of between twenty-seven and thirty-four days. This lengthy convalescence is believed to be a major factor in the lack of serious complications in this series.

Allantoin-Sulfanilamide-Lactose Ointment in Infections of Cervix, Vagina and Vulva.—The ointment used by Parks contains 2 per cent allantoin, 15 per cent sulfanilamide and 5 per cent lactose in a special greaseless base buffered to a p_H of 4.5 with lactic acid. A total of 68 patients have been treated with this preparation. Surface infections of the exocervix, vagina and vulva, with the exception of vulvovaginal mycoses, respond to local applications of the ointment. Its expression through a tube into the vaginal vault is a quicker

and more efficient method of applying local medication than by insufflation or suppository technic. The ointment is odorless and has no staining properties. Its action is entirely local. It is not curative for such lesions as condyloma acuminatum, granuloma inguinale and lymphogranuloma venereum, but it offers a relatively rapid means of reducing nonspecific, secondary infection to a minimum. Inguinal buboes and gonorrheal infections in the remote recesses of the urethra, endocervix, tubes and vulvovaginal glands are influenced by this form of local therapy only as far as they are affected by eradication of surface infection of the cervix, vagina and vulva. Allantoin-sulfanilamide-lactose ointment presents a convenient and rapid method of treating Trichomonas vaginalis vaginitis. Chancroids are rendered asymptomatic and the areas of ulceration heal rapidly with little scarring. The gratifying results obtained with allantoin-sulfanilamide-lactose vaginal ointment recommend it as a convenient and effective method of treating many ulcerative lesions of the lower genital tract of the female.

Military Surgeon, Washington, D. C.

92:473-582 (May) 1943. **Partial Index**

Care and Treatment of Wartime Injuries to Head: Review of Some Recent Literature. O. A. Turner.—p. 473.
Neurotropic Virus Diseases. J. A. Rogers.—p. 494.
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Minnesota Medicine, St. Paul

26:401-504 (May) 1943

Procurement and Assignment Service for Physicians, Dentists and Veterinarians: Responsibilities, Accomplishments and Future Problems. H. S. Diehl.—p. 419.
Collapse Therapy in Treatment of Pulmonary Tuberculosis. G. A. Hedberg.—p. 428.
Chest Conditions Simulating Tuberculosis. E. R. Crow.—p. 430.
Naturally Acquired Tuberculosis in Heterologic Hosts. W. H. Feldman.—p. 437.
Diagnosis of Early Tuberculosis Among University Students. R. E. Boynton.—p. 439.
How a County Can Be Accredited for Tuberculosis Control. S. A. Slater.—p. 443.

New England Journal of Medicine, Boston

228:499-528 (April 22) 1943

Significance of Systolic Cardiac Murmurs in College Students. A. W. Contratto.—p. 499.
*Death from Allergic Shock. E. L. Hunt.—p. 502.
Technical Considerations in Excretory Urography. R. O. Pearman.—p. 507.

228:529-558 (April 29) 1943

Pharmaceutical Manufacturer and Academic Research. F. Boyer.—p. 529.
Acute Appendicitis in Patients with Common Contagious Diseases. M. Goodman and I. Silverman.—p. 533.

Death from Allergic Shock.—Hunt reports a sudden death following the intradermal administration of guinea pig hemoglobin. A relative of this patient was the first person in this country to die suddenly from diphtheria antitoxin. There apparently existed a familial hypersensitiveness. The Prausnitz-Küstner test was utilized as a postmortem procedure in Hunt's case with positive sensitization in 2 out of 3 normal persons. Persons hypersensitive to proteins of small animals are to be considered in the same category as those who are sensitive to horses so far as the dangers of foreign protein therapy are concerned. Use of the intradermal route for preliminary testing is discouraged. Conjunctival or scratch tests are preferable. If the intradermal method is necessary, maximum precautions should be observed. Parenteral therapy by antigenic substances requires meticulous observance of precautions.

New York State Journal of Medicine, New York

43:801-896 (May 1) 1943

Management of Cervix in Treatment of Fibromyoma of Uterus. J. A. Corscaden.—p. 829.
Radical Surgery for Carcinoma of Skin. F. Young.—p. 836.
Discrepancies in Serologic Findings as Shown by Results of Washington Serology Conference. J. F. Mahoney.—p. 843.
Infectious Mononucleosis: From Point of View of General Practitioner. H. B. Sokal.—p. 848.
Conservative Management of Acute Osteomyelitis. J. B. L'Episcopo and E. D. Hagerty.—p. 853.
*Treatment of Herpes Zoster Ophthalmicus with Smallpox Vaccine. W. I. Lillie.—p. 857.

43:897-992 (May 15) 1943

Investigative Psychotherapy in Certain Types of Criminals. G. Zilboorg.—p. 928.
Osteogenic Sarcoma or Vertebrae Secondary to Paget's Disease: Report of 3 Cases with Compression of Spinal Cord and Cauda Equina. E. Campbell and R. D. Whitfield.—p. 931.
Medicolegal Aspects of Trauma and Malignant Testis Tumors. J. B. Gilbert.—p. 939.
Diagnosis and Treatment of Obstructive Jaundice. J. D. Stewart.—p. 946.
Reduced Temperature Treatment for Burns and Frostbite. F. M. Allen, L. W. Crossman and F. K. Safford Jr.—p. 951.
Role of Bronchoscopist in Diagnosis and Treatment of Diseases of Bronchial Pulmonary Tract. A. Q. Penta.—p. 953.
Use and Advantages of Augmented Unipolar Extremity Leads (a V-Leads) in Electrocardiographic Diagnosis of Myocardial Infarction. E. Goldberger.—p. 961.

Smallpox Vaccine for Herpes Zoster Ophthalmicus.—According to Lillie, herpes zoster ophthalmicus belongs to the herpes group in which the fifth cranial nerve is involved. During the past four years a group of these cases with and without corneal involvement has been treated by vaccination with smallpox vaccine at intervals of from two to ten days. Three cases are described. The first patient had a severe local reaction to each smallpox vaccination, and the ocular improvement was rapid even though the condition had persisted for more than three months before this vaccine treatment was instituted. The second patient had previously had the usual accepted treatment without improvement. The third had had no previous treatment. The response to the vaccine therapy was rapid. The author concludes that smallpox vaccination instituted early in herpes zoster ophthalmicus is efficacious in relieving both the subjective and the objective phase of the disease. The improvement has occurred regardless of the duration of the disease and the type of the previously instituted treatment. The earlier the smallpox vaccine was used, the quicker signs and symptoms were relieved.

North Carolina Medical Journal, Winston-Salem

4:117-160 (April) 1943

Military Environment Primarily in Relation to Changes in Barometric Pressure as Applied to Clinical Medicine. A. R. Behnke.—p. 117.
Electric Shock Treatment of Mental Disorders. H. Lowenbach.—p. 123.
Diabetes Mellitus, with Special Reference to Complications Involving Feet. J. R. Williams Sr.—p. 129.
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Postoperative Pulmonary Atelectasis. J. T. Kerr.—p. 137.
Nursing as Foundation of Medicine. W. C. Davison.—p. 141.

4:161-196 (May) 1943

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Evolution of Drug Therapy. A. Grollman.—p. 175.

Northwest Medicine, Seattle

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Use of New Ephedrine-like Drug in Hay Fever and Asthma. A. J. Friedman and A. E. Cohen.—p. 138.

Southern Medical Journal, Birmingham, Ala.

36:321-392 (May) 1943

Cancer of Larynx. M. Equen, F. Neuffer and W. B. Matthews.—p. 321.
Passive Autosensitization and Desensitization: Further Observations. W. R. Mason Jr. and O. Swineford Jr.—p. 324.
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New Type of Bayonet Surgical Scissors. L. C. Blair.—p. 338.
Implication of Hypothalamus in the Psychotic: Report of Case. H. S. Rubinstein and S. Androp.—p. 340.
Neurologic Diagnosis. J. D. Campbell.—p. 348.
Alcohol and Cirrhosis of Liver. R. S. Boles.—p. 353.
Porphyria. C. J. Watson.—p. 359.
Modern Methods of Procedure in Obstetric and Gynecologic Practice. R. M. Lewis.—p. 363.
*Importance of Antral Mucosa in Surgical Treatment of Duodenal Ulcer. A. W. Allen.—p. 368.
Medical and Nutritional Survey of 800 Youths: Experience at National Youth Administration Work Center in Physical Rehabilitation of Youths of Draft Age. I. H. Manning Jr. and D. F. Milam.—p. 373.
Contact Dermatitis. W. T. Vaughan.—p. 380.
Teaching of Military Medicine in Medical Schools. E. P. Lehman.—p. 382.
Accelerated Internship. L. E. Jarrett.—p. 385.

Antral Mucosa in Surgical Treatment of Duodenal Ulcer.—Allen states that approximately 80 per cent of the patients coming to the Massachusetts General Hospital with duodenal ulcer are satisfactorily treated by conservative measures. Surgical ulcers, except acute perforation, must be treated radically. Conservative operations give a high incidence of poor results and should be abandoned. Complete elimination of the antral mucosal cells is necessary for the highest degree of success. This can be accomplished by the resection of the distal half to two thirds of the stomach. When technical difficulties make this unsafe, the antral mucosa should be removed in any segment left for adequate closure. It is by these methods that the most serious complications of inadequate operation, namely anastomotic or jejunal ulcer, may be prevented.

Southwestern Medicine, Phoenix, Ariz.

27:61-90 (March) 1943

Acute Abdominal Conditions. W. W. Haggart.—p. 62.
Emergency Treatment of Abdominal Traumas. E. P. Palmer.—p. 64.

Surgery, St. Louis

13:495-652 (April) 1943

Physiologic Basis for Surgical Treatment of Asthma. L. Miscall and E. A. Rovenstine.—p. 495.
Fascia Lata Transplant for Difficult Hernias. A. H. Iason.—p. 511.
Free Autoplastic Transplants of Fascia Lata in Repair of Large Incisional Hernia. L. J. Morse and J. S. Barb.—p. 524.
Consideration of Factors Influencing Surgical Repair of Inguinal Hernia. H. Lavender.—p. 535.
Intestinal Capillary Circulation During Distention. M. J. Oppenheimer and F. C. Mann.—p. 548.
Chronic Partial Intestinal Obstruction Due to Intussusception of an Appendix Epiploica. M. S. Harte.—p. 555.
Microscopic Diagnosis of Radiopaque Substance in Vermiform Appendix. S. Sanes and J. Ambrusko.—p. 561.
Method of Reconstructing Sphincteric Mechanism in Anal Incontinence. J. F. Ruzic, R. L. Voller, C. L. Janda and D. S. DiCiro.—p. 569.
Carcinoma Metastases in Appendices Epiploicae. R. K. Gilchrist and V. C. David.—p. 574.
Hemangiopericytoma of Omentum. A. P. Stout and C. Cassel.—p. 578.
Early and Late Topical Use of Sulfathiazole in Infected Wounds. L. W. Riba and W. G. Aten.—p. 582.
*Chemotherapy in Penetrating Abdominal Gunshot Wounds. F. L. Loria.—p. 588.
Consideration of Empyema, Especially Its Chronic Phase. J. E. Strode.—p. 598.
New Procedure for High Frequency Coagulation. R. R. Flores.—p. 610.

Chemotherapy in Penetrating Abdominal Gunshot Wounds.—Loria reports a group of 100 cases of penetrating gunshot wounds of the abdomen admitted to the New Orleans Charity Hospital. Forty-nine received some form of chemotherapy, while 51 did not. In the chemotherapeutically treated group the mortality was 18.4 per cent. In the group not so treated the mortality was 50.9 per cent. In a group of 11 patients in whom intraperitoneal implantation of sulfathiazole was practiced there were no fatalities. Sulfathiazole was the drug used. None of the patients so treated showed any evidence of toxicity attributable to these drugs. Peritoneal fluid concentrations were not determined, since none of the patients were drained. A small number of blood level determinations of the drug failed to show high figures, although large doses were implanted intraperitoneally. The sulfonamides are especially helpful to patients showing "massive" hemorrhage. Such patients showed a 91.6 per cent mortality in the group receiving no chemotherapy, as compared with 40 per cent fatality in the group receiving sulfonamide treatment.

Tennessee State Medical Assn. Journal, Nashville

36:127-162 (April) 1943

Description of an Industrial Medical Program in an Aircraft Factory. C. Harrison.—p. 127.
Epidemic Keratoconjunctivitis. M. L. Berliner.—p. 138.
Treatment of Carcinoma of Lip with Special Reference to Management of Regional Lymph Nodes. H. Wilson.—p. 140.

36:163-204 (May) 1943

Essential Qualifications of a Great Surgeon. E. Sachs.—p. 173.

Texas State Journal of Medicine, Fort Worth

39:1-52 (May) 1943

Nephritis and Nephrosis. E. T. Bell.—p. 6.
Splenectomy, Its Medical Management. W. L. Marr, with technical assistance of Elsie Washburn.—p. 8.
Some Cardiac Evidence of Vitamin Deficiency. L. P. Hightower.—p. 11.
Hypoglycemic States. L. M. Helfer.—p. 15.
Photofluorography in Chest Survey Projects. F. J. Hodges.—p. 19.
Diagnostic Facilities for Indigent Tuberculous in Texas. E. G. Faber.—p. 24.
Psychoses of Pregnancy. A. T. Stewart.—p. 27.
Use of Fascia in Repair of Hernias. L. R. Sadler.—p. 32.
Familial Corneal Dystrophy: Report of Family with Granular Dystrophy. R. K. Daily.—p. 34.

War Medicine, Chicago

3:447-564 (May) 1943

Arthropod Borne Diseases: with Special Reference to Prevention and Control. S. Jarcho.—p. 447.
Packet Type of Kit for Venereal Disease Prophylaxis: Preliminary Report Concerning Its Use. I. A. Pelzman and J. W. Still.—p. 474.
Experimental Burns: I. Methods, Mortality and Hemoconcentration Curves. R. Elman and F. L. Brown Jr., with technical assistance of H. Riedel.—p. 477.
Id.: II. Effect of Elastic Pressure Applied to Burned Area. C. Lischer and R. Elman, with technical assistance of H. Riedel.—p. 482.
Development of Medical Service for Airline Operations in Africa. Medical Department, Pan American Airways—Africa, Ltd. L. T. Coggeshall and others.—p. 484.
Morale. L. R. Sillman.—p. 498.
Amblyopia in Hysteria: Report of 13 Cases. V. P. Mahoney and W. O. Linhart.—p. 503.
Active Immunization of Human Beings with Combined Clostridium Perfringens and Tetanus Toxoids. Sarah E. Stewart.—p. 508.

Wisconsin Medical Journal, Madison

42:373-456 (April) 1943

Low Back Pain: Anatomic and Constitutional Aspects in Differential Diagnosis. H. E. Mock.—p. 389.
Abdominal Apoplexy: Report of 2 Cases. P. F. Doege and J. H. Gray.—p. 400.
Surgical Scarlet Fever. M. J. Fox and M. Hardgrove.—p. 402.
Disorders of Newborn. S. E. Kohn.—p. 404.
Leptospira Icterohemorrhagiae (Weil's Disease): Study of First Reported Case in Wisconsin. Jacob M. Fine and Warren J. Conen.—p. 408.
Mumps Followed by Orchitis and Meningitis: Case Report. V. W. Koch.—p. 414.
Epidemic Keratoconjunctivitis. E. C. Bach.—p. 415.

42:473-564 (May) 1943

Pathologic Physiology of Hemorrhage. F. W. Madison.—p. 495.
Treatment of Shock. C. F. Conroy.—p. 498.
Shock and Hemorrhage. J. S. Supernaw.—p. 501.
Treatment of Obstetric Hemorrhage. J. M. Freeman.—p. 505.
Treatment of Traumatic Hemorrhage. A. C. Taylor.—p. 508.
The Management of Nontraumatic Hemorrhage. W. A. Killins.—p. 512.
Making Ration-Limited Diets Adequate. E. L. Sevringhaus.—p. 517.
Technic of Home Canning. Dorothy L. Hussemann.—p. 522.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

16:129-156 (May) 1943. **Partial Index**

Osteogenesis Imperfecta. J. F. Brailsford.—p. 129.
Response of Cells in Vitro to Variations in X-Ray Dosage. Ilse Lasnitzki.—p. 137.
Osteochondritis Dissecans: Records of Some Unusual Cases. R. G. Hutchison.—p. 147.
Radiologic Changes in Carotid Cavernous Aneurysm. R. A. K. Harper. —p. 150.
Endothelioma of Peritoneum: Case Report. A. E. Connolly.—p. 153.

British Medical Journal, London

1:591-622 (May 15) 1943

Head Injuries in Motor Cyclists, with Special Reference to Crash Helmets. H. Cairns and H. Holbourn.—p. 591.
Diet in Diabetes. R. H. Micks.—p. 598.
Treatment of Asthma by Nicotinic Acid. G. Melton.—p. 600.
Meningitis Due to Diplococcus Mucosus. P. T. Bray and J. C. Cruickshank.—p. 601.
Multiple Muscle Hernias. I. D. Kitchin and D. A. Richmond.—p. 602.

Edinburgh Medical Journal

50:193-256 (April) 1943

*Value of Postoperative Radiotherapy in Carcinoma of Breast. R. McWhirter.—p. 193.
Modern Trends in Preventive and Social Aspects of Tuberculosis. C. Clayson.—p. 208.
Studies in Refractory Anemia: I. Technic and Interpretation of Sternal Puncture Biopsies. Classification. L. S. P. Davidson, L. J. Davis and J. Innes.—p. 226.
Endemic Fluorosis in Great Britain. L. Spira.—p. 237.

Postoperative Radiotherapy of Carcinoma of Breast.—McWhirter states that, when surgery is the only method of treatment available, survival for five years probably does not occur in more than 1 in 5 of all cases of cancer of the breast. The three year symptom free rate is a reliable guide to the five year survival rate. A total of 1,879 cases has been analyzed. In the operable group (stages 1, 2 and 3) effective postoperative radiotherapy, by destroying cells left behind in the "treatable area," results in much higher three year symptom free rates in all three stages. Postoperative radiotherapy is still effective when the disease has spread to the axillary glands but is of no value so far as survival rate is concerned if the disease has spread to distant sites. Simple mastectomy combined with postoperative radiotherapy as a method of improving results and as a means of diminishing disability is on trial. Survival to five years in the advanced (stage 4) group is so low as to be accidental, irrespective of the method of treatment. The delay which occurs between the time the patient first notices "something wrong" and treatment is on an average nine months. Treatment before the stage of clinical certainty is reached is strongly advocated if further progress is to be made. At the early highly curable stage a clinical differential diagnosis should not be attempted. Excision and microscopic examination is the only reliable means of diagnosis. If medical delay is eliminated, the cure of at least 1 out of every 2 of all cases of cancer of the breast is easily possible with methods of treatment at present available.

Journal of Royal Army Medical Corps, London

80:167-226 (April) 1943

Rehabilitation. S. D. Large.—p. 168.
*Acute Fulminating Hemolytic Syndrome, Fat Necrosis of Liver and Acute Necrotizing Nephrosis Following Sulfanilamide Therapy. R. S. Murley.—p. 182.
Emergency Medical Service. R. J. Blackham.—p. 199.

Acute Syndrome Following Sulfanilamide.—Murley describes a case in which an acute fulminating hemolytic syndrome developed following the administration of 12 Gm. of sulfanilamide to an Indian sepoy with multiple venereal sores. Fat necrosis of the liver and acute necrotizing nephrosis accompanied the hemolytic syndrome. The much dreaded agranulocytosis is a complication of prolonged or injudicious dosage in the great majority of cases. Agranulocytosis is a late complication of chemotherapy and is rarely seen when the drug is carefully used. Acute hemolytic anemia, however, is an early complication which is unrelated to incautious use of the drug and may occur in the hands of the most careful clinician. The importance of exercising adequate caution in chemotherapy is stressed.

Lancet, London

1:573-604 (May 8) 1943

Lytic Agent and Inhibitory Factors in Human Tissue and Sera: Changes in Serum Inhibitor Factor in Blackwater Fever. B. G. Maegraith, G. M. Findlay and N. H. Martin.—p. 573.
Immediate Death After Use of Intravenous Mercurial Diuretics. H. Evans and K. M. A. Perry.—p. 576.
Vitamin C Intakes in Small Ship. C. C. Ungley.—p. 578.
Acridine Antiseptics: Further Experiments on Their Local Action. Dorothy S. Russell and M. A. Falconer.—p. 580.
Pneumococcic Meningitis: Recovery After Sulfapyridine and Serum Therapy. H. A. Thomas, R. J. Twort and C. P. Warren.—p. 581.
Streptococcic Infection of Muscle. J. D. MacLennan.—p. 582.
Spontaneous Rupture of Spleen in Malignant Tertian Malaria. G. S. W. De Saram and R. F. Townsend.—p. 584.

1:605-636 (May 15) 1943

*Penicillin and Propamidine in Burns: Elimination of Hemolytic Streptococci and Staphylococci. A. M. Clark, L. Colebrook, T. Gibson, M. L. Thomson and A. Foster.—p. 605.
Treatment of Burns at Tobruk. N. J. Logie.—p. 609.
*Thrombosis: Treatment and Prevention with Methylene-Bis-(Hydroxycoumarin). J. Lehmann.—p. 611.
Observations on Autohemagglutination. F. Stratton.—p. 613.
Slide Culture Method for Tubercle Bacilli. K. S. Rosenberg.—p. 615.
Fatal Air Embolism After Insufflation of Vagina. R. L. Brown.—p. 616.

Penicillin and Propamidine in Burns.—Clark and his associates point out that the predominant part played by the hemolytic streptococcus and the staphylococcus in interfering with the repair of burns makes it desirable to perfect means for preventing and controlling infection by these organisms. Sulfanilamide is not quite the ideal agent for this purpose. The authors applied penicillin in the form of a cream to 54 burns and scalds in various stages of healing. In 41 of the wounds (76 per cent) the streptococci disappeared within five days and did not reappear. In 7 the strains which promptly disappeared were insensitive to the sulfonamides. There were no cases in which penicillin appeared to have no effect. Staphylococci also disappeared quickly from many of the wounds. Healing was rapid and no toxic effects were observed. Propamidine was applied in the form of a cream (0.1 per cent) to 34 similar burns. Hemolytic streptococci disappeared within five days from 21 of the wounds (62 per cent). They persisted in 8 cases during treatment with propamidine. Of these, 3 lost their streptococci promptly when they were later treated with penicillin. Healing was not quite so rapid as with penicillin. No toxic effects were observed. Coliform bacilli, Proteus vulgaris and Pseudomonas pyocyanea, when present in the wounds, were apparently not affected by either agent.

Treatment and Prevention of Thrombosis.—Lehmann of Gothenburg, Sweden, gave dicumarol, the anticoagulant first obtained from spoiled sweet clover hay, by mouth to 100 persons with established venous thrombosis in the lower limb and 32 with thrombophlebitis. In thrombosis the mean recovery time was reduced to from one to three weeks, a third of what it was before anticoagulants were used, and in thrombophlebitis to six and one-half days. The anticoagulant was also given prophylactically to 170 patients after various gynecologic operations during 1942; only 1 case of venous thrombosis and 1 mild case of embolism were seen, and there were no deaths from these causes. In 1941 there had been 9 cases of thrombosis and 5 of embolism, with 3 deaths, in a comparable series. In about 1 case in 10 hemorrhage occurred as a complication, but in only 1 in 100 was it at all profuse and in these it was readily controlled with vitamin K and blood transfusions.

Medical Journal of Australia, Sydney

1:225-244 (March 13) 1943

Scheme for Medical Service for Commonwealth. K. J. B. Davis.—p. 225.
Considerations on Scheme for Salaried Medical Service of National Health and Medical Research Council. C. T. Piper.—p. 229.

Schweizerische medizinische Wochenschrift, Basel

72:1237-1260 (Nov. 7) 1942. **Partial Index**

When Is Roentgen Therapy of Cancer Indicated and What Can Be Expected From It? M. Lüdin.—p. 1237.
Treatment of Torpid Cutaneous Ulcers by Vitamin C. A. Tey, E. Criscuolo and P. Marhuenda.—p. 1242.
Sensitive and Specific Clinical Procedure for Demonstration of Blood in Urine Feces and Gastric Juice with Use of Spectroscopic Method. R. Eder and C. von Lippert.—p. 1245.
*Parodontitis as Important Symptom in Early Diagnosis of Diabetes Mellitus. J. W. Grott.—p. 1249.
New Experiences on Mode of Action of Vitamin K in the Newborn. N. Fiechter.—p. 1252.
Electroencephalography in Man. M. Monnier.—p. 1253.

Parodontitis in Early Diagnosis of Diabetes.—Grott surveyed 350 patients with diabetes for the presence of parodontitis. Particular attention was paid to looseness of teeth and to the length of time these symptoms existed before the discovery of the diabetes. It was found that 148 of the patients had loose teeth; 34 others had symptoms of parodontitis without looseness of teeth. Of a total of 350 patients, 182 (52 per cent) had had changes in the parodontium before diabetes was recognized. In 80 of the 148 patients the symptoms of parodontitis antedated the discovery of diabetes by from one to five years and in 68 by five years. These figures indicate that symptoms of parodontitis can be of value in the early diagnosis of diabetes. If no sugar is detected in the urine in the presence of a parodontitis a tolerance test should be made and the blood sugar curve investigated.

72:1261-1288 (Nov. 14) 1942. **Partial Index**

*Coronary Sclerosis in Young Persons. B. Walthard.—p. 1261.
Hormones in Chemical Heat Regulation and Two Hitherto Unknown Hormones of Thyroid. G. Mansfeld.—p. 1267.
Surgery in the Aged. F. Becker.—p. 1273.
Investigations on Mode of Action of Vitamin B_1. E. Góth.—p. 1275.
Treatment of Acute Appendicitis with Sulfathiazole. J. L. Burckhardt.—p. 1277.
Nicotinic Acid Amide in Pernio. H. Birkhäuser.—p. 1280.
Scotoma in Plumbism. R. de Montmollin.—p. 1284.

Coronary Sclerosis in Young Persons.—Walthard reviews the causation of coronary sclerosis; he studied 18 cases. Two cases of endocarditis lenta are intentionally included in order to demonstrate the insignificance of a mycotic inflammatory process for the genesis of coronary sclerosis. The remaining 16 are typical cases of coronary sclerosis in persons between the ages of 20 and 40. Postmortem examinations were negative as to the existence of a focal inflammation. The structure of the intimal plaques in the endocarditis lenta cases with the mycotic infectious foci was the same as in other cases of arteriosclerosis. It was not possible to establish a relation of focal inflammation to the development of a narrowing coronary sclerosis, an inflammatory sclerosis. The concept arteritis stenosans coronariae should be rejected. The process in question is not a primary inflammation in the form of an infection but rather a reparative secondary inflammation in the course of a progressive coronary sclerosis that leads to contraction of the artery.

Archivos de Medicina Infantil, Havana

12:69-132 (April-May-June) 1943. **Partial Index**

Chorea in Children. A. M. Abril.—p. 69.
*Cruveilhier-Baumgarten Syndrome (Jaundice Due to Sclerotic Hepatitis) in Infant: Case. A. Castellanos.—p. 86.

Cruveilhier-Baumgarten Syndrome.—According to Castellanos, congenital jaundice due to sclerotic hepatitis (the so-called Cruveilhier-Baumgarten syndrome) is extremely rare in infants. The main symptoms are portal hypertension with consequent enlargement of the superficial veins of the portal system, hepatomegaly, splenomegaly, functional liver insufficiency and jaundice. The abdomen is balloon-like, the umbilicus is herniated, the face is puffy, the epicranial and cervical veins are enlarged and the fingers are clubbed. The physical and mental development of the patient is delayed. The diagnosis is confirmed by a puncture biopsy of the liver. The liver presents adult connective tissue and local sclerosis. The therapy consists of antisyphilitic drugs, regardless of whether the serologic tests of the infant or of the parents are negative. The case reported by the author in an infant of 22 months is the third on record in world literature. The patient was improved by antisyphilitic therapy.

Revista de Neurol. e Psiquiat. de São Paulo, São Paulo

8:167-228 (Sept.-Oct.) 1942. **Partial Index**

Encephalitis After Vaccination. D. Fleuri Silveira.—p. 167.
*Auricular Herpes Zoster: Cases. L. de Assis and P. da Cunha Cintra.—p. 179.

Auricular Herpes Zoster.—Localization of the virus of herpes zoster in the geniculate ganglion is rare. It produces the so-called Ramsay-Hunt syndrome, which manifests itself by facial paralysis and cutaneous vesicles or pustules along the external auditory canal and the pinna. The neurologic symptoms may appear either early or late in the course of the disease, or during regression of the cutaneous and mucosal lesions. The pure form of the disease is benign. The symptoms slowly regress and disappear completely in from two to four months. The therapy consists in intense administration of vitamin B. Faradization is applied to the muscles two or three weeks after the appearance of paralysis. The appearance of muscular contractions in the course of the electrical therapy calls for discontinuation of faradization. Salicylates and strychnine by mouth or injection are helpful. Sulfanilamide is useless and dangerous because of its toxic effect on the peripheral nerves. Two cases are reported.

Klinische Wochenschrift, Berlin

21:121-144 (Feb. 7) 1942. **Partial Index**

Standardization of Animal Experiments by Use of Inbred Strains Kept Under Constant Environmental Conditions. H. W. Denzer.—p. 126.
*Studies on Bacterial Growth and Its Prevention in Preserved Blood. K. Reissmann.—p. 127.
*Serologic Behavior of Keratitis Parenchymatosa at Various Ages. W. Schmidt.—p. 132.
Experimental Investigations on Regulation of Blood Protein Bodies by Endocrine System: Thyroid and Serum Proteins. L. Podhradszky.—p. 134.
Use of Preserved Complement in Serodiagnosis. H. Gross and G. Henning.—p. 136.

Bacterial Growth and Its Prevention in Preserved Blood.—Reissmann detected bacterial contamination in preserved blood which showed no hemolysis and in which the Duran-Jorda test had failed. The fact that the transfusion of preserved blood caused chills and rise in temperature in a larger percentage of cases than transfusion of fresh blood induced him to make a bacteriologic test of every unit of preserved blood. The tests revealed that about 6 per cent of the units of preserved blood were contaminated, chiefly with staphylococci. This high percentage and a severe reaction in 1 patient who was given a transfusion of preserved blood which was found to contain colon bacilli induced a search for a disinfecting substance. Tests were made with several sulfonamide preparations, with propyl-hydroxybenzoate and related substances and with acridine dyes, such as rivanol and acriflavine hydrochloride. Rivanol gave the best results. When 2 mg. of rivanol was added to 100 cc. of blood, the majority of contaminating bacteria were either killed or inhibited and no harmful effect was exerted on the blood. Preserved blood which contained this addition was well tolerated and its effect did not differ from other preserved blood. The author's studies were made in the course of the preparation of 4,000 specimens of preserved blood.

Serologic Behavior of Keratitis Parenchymatosa.—Schmidt's observations on 34 cases of parenchymatous or interstitial keratitis did not corroborate the widely held opinion that the strongly positive serologic reactions are about equally frequent in keratitis patients of all age groups and that they show the same refractoriness to specific treatment in adults as in children. He found that intensely positive reactions are most frequent in patients between 10 and 15 years of age. The frequency of the intense reactions decreases with age. Only about half of the patients in whom interstitial keratitis develops after the twenty-fifth year show strongly positive serologic reactions. The prospects of conversion of the positive serologic reactions into negative by the antisyphilitic treatment are much better in patients over 20 than in children. One series of antisyphilitic treatments failed to produce negativity in all of 4 children less than 10 years old and in 19 of 20 children between 10 and 20, but in only 6 of 10 patients in the third and fourth decades of life.

Book Notices

Compendium of Aviation Medicine. By Siegfried Ruff and Hubertus Strughold. [English translation.] With introduction by Surgeon General Prof. Dr. Erich Hippke, Chief of the Medical Staff of the German Air Corps. Reproduced Under a License Granted by the Alien Property Custodian, 1942. Paper. Pp. 130, with 103 illustrations. Washington, D. C.: National Research Council, 1942.

This book was offered in 1939 as a practical textbook for aviators, medical students and physicians concerned with medical problems in aviation. The authors point out that German aviation medicine has not been content with practical research alone but has also boldly attacked the scientific fundamentals of the problem. Their object has been not to prepare an exhaustive source book for specialists but rather to present to the medical profession at large a body of information concerning the results of these investigations and to make accessible a cross section of the status of contemporary medical aviation. Both authors are particularly well qualified for this task, having made important contributions to research in several aspects of aviation medicine. In spite of its modest aspirations, this book constitutes a significant contribution to the subject. Although three years old and despite the welter of open and confidential literature which has since become available, this work is of special value in the English language because of the early and extensive preoccupation of the Germans with aviation medicine.

The present translation has been reproduced under a license granted by the alien property custodian. The translator has prepared the text in an attractive and readable style and has at the same time faithfully preserved the sense and form of the original. The illustrations and text have been adequately prepared by the National Research Council within the limits of the planograph technic.

Dr. Erich Hippke, "Chef des Sanitätswesens der deutschen Luftfahrt," who has written the preface, refers to the book as comprehensive. However, there are notable omissions. Specifically, the reader finds no discussion of vision, hearing, alimentary or renal function or the endocrine glands in relation to aviation. Nor are bacteriology and immunology in aviation, decompression sickness ("bends"), pathology of aviation, selection, testing and sanitary aviation included. In view of current interest, the absence of consideration of the "bends" is especially surprising but possibly significant.

Chapter I reviews the historical background of aviation medicine. The treatment is sketchy, surprisingly so considering the rich historical bibliographic material available to the authors in Schmidt's Bibliographie der Luftfahrtmedizin. Chapter II contains a well written discussion of the effects of altitude on the body. There is an excellent section on the physics and chemistry of the atmosphere. Research methods and terminology in aviation medicine are briefly reviewed. Then follow sections on the blood, respiration, the circulation and the central nervous system. The effects of altitude on consciousness and reflex behavior are touched on. Altitude tolerance is treated in some detail. Physical, biologic, dietetic and pharmacologic factors in determining the body's resistance to flight conditions are discussed. The chapter closes with a consideration of acclimatization and the possible biologic effects of cosmic rays. Chapter III is a review of the effects of linear, radial and angular acceleration on the organism. Problems raised include the effects of opening the parachute, launching the plane from the catapult, directional changes in the plane and rotation in the centrifuge. In chapter IV is given a very incomplete account of sensory physiology in flight. Chapter V contains an analysis of the causes of flying accidents and in chapter VI, under the title of "comparative physiology of flight," the wing structure and action of birds are described. The physiologic adaptations of the lower animals to high altitudes—of considerable intrinsic interest as well as practical importance in sanitary aviation—are not discussed.

Throughout the text the effects of flight on the body are considered in the light of normal physiologic mechanisms, and wherever necessary the reader is given lucid explanations of physical and mathematical principles involved. The lack of an index is to be deplored.

Scoville's The Art of Compounding. By Justin L. Powers, Ph.D., Chairman of the Committee on National Formulary, and George E. Crossen, Ph.D., Dean and Professor of Pharmacy, Drake University, Des Moines. Seventh edition. Fabrikoid. Price, $4.75. Pp. 457, with 57 illustrations. Philadelphia: Blakiston Company, 1943.

This edition presents an improved and modernized textbook for students in dispensing pharmacy. The authors have adjusted the length and content of many of the chapters to conform with changing methods and improved practices. The sequence has been somewhat revised to provide a more logical and desirable order for the presentation of the material. The first chapter deals with the origin and structure of the written prescription and describes its reception, checking, compounding, labeling, pricing and filing by the pharmacist. The second chapter discusses nomenclature, vocabulary and Latin terms and their abbreviations. The consideration of incompatibilities has been expanded into three chapters and the material has been rearranged. Improved arrangement is especially evident in the chapter on chemical incompatibilities, in which the cations are grouped according to their positions in the periodic table so that the student can use his knowledge of chemistry to better advantage. The consideration of incompatibilities has been moved forward. From the standpoint of usefulness this change in order is a very desirable one. While it may tend temporarily to cloud the student's perspective of prescription dispensing, it should result in a clearer understanding of the material covered in succeeding chapters. Chapters 6 to 9 deal with various solutions. The material on isotonic solution especially is presented in a clear and understandable manner. A general discussion of hydrogen ion concentration and its application to the preparation of buffered solutions is included. However, the application of buffering to specific groups of solutions would have been valuable to the student. For instance, medical schools teach that collyriums should be buffered, but pharmacy students and pharmacists would have difficulty in preparing buffered collyriums from the information in the text. Succeeding chapters cover the various types of pharmaceutical preparations and prescriptions. The chapter on pills is probably too lengthy for present needs of pharmacy and medicine. Emulsions are discussed comprehensively, but the reader has difficulty in finding the meaning of an o/w or w/o emulsion without searching for the scattered threads of the explanation through a number of paragraphs. Chapters on vitamins and biologic products are brief but adequate. Chapter 23, on sterilization, is very complete but the sterilization of certain sulfonamides for intraperitoneal and external use as bacteriostatics is not mentioned. With the added material, the change in chapter sequence and improved style, this edition should be of greater usefulness than the sixth to students in pharmacy and to practicing pharmacists.

Synopsis of Traumatic Injuries of the Face and Jaws. By Douglas B. Parker, M.D., D.D.S., Associate Professor, Department of Oral Surgery, School of Dental and Oral Surgery, Columbia University, New York. Fabrikoid. Price, $4.50. Pp. 334, with 229 illustrations. St. Louis: C. V. Mosby Company, 1942.

The presentation of this book achieves the author's desire to provide a concise, well illustrated manual for the medical and dental professions on the subject of face and jaw injuries of traumatic origin. The author states that it was not his intention to produce a textbook on oral surgery or plastic surgery but rather in a synopsis form to present the treatment of maxillofacial cases from first aid at the scene of injury to the more definitive treatment at a more permanent base.

Physicians and dentists join their efforts in the treatment of maxillofacial cases. This cooperation and team work can be expected to assume an important role in this war and the years to follow. A number of special courses of instruction in maxillofacial surgery have been given in the military service, civilian institutions and organizations. The attendance of these courses clearly indicates the earnest desire of surgeons and oral surgeons to improve themselves professionally and to obtain a more adequate training in basic and emergency surgical procedures.

Adequate first-aid and early treatment of face and jaw casualties is encouraged as a means of effecting their return to duty as soon as possible. Inadequate or delayed treatment may contribute to prolonged hospitalization and unusually difficult

surgical and mechanical procedures to obtain satisfactory results. The text is made up of twenty chapters, captioned to cover the incidence of face and jaw injuries, anatomical review of the maxillofacial field, initial treatment and early complications, followed in good sequence by the various treatments that may be accomplished in the intermediate stage, and again the complications that may occur. In later chapters, measures for definitive treatment are well covered and include treatment of fractures, surgical reconstruction and surgical prosthetic restorations. There is also a chapter on diet and feeding of face and jaw casualties. The final chapter is one on the medicolegal aspect of traumatic injuries of the face and jaws.

The author has not limited his methods and procedures to his own but has included a goodly number of ideas and policies of other operators, thereby giving the reader an opportunity of choice of opinions on various methods that have proved to be satisfactory in their hands. The bibliography following each chapter is quite complete and provides reference for additional data on each subject. This small book contains an unusual amount of information on the subject and certainly is an invaluable aid to the physicians and dentists who will minister to those unfortunate ones receiving injuries in civil and military life.

The Embryological Treatises of Hieronymus Fabricius of Aquapendente: The Formation of the Egg and of the Chick [De Formatione Ovi et Pulli]; The Formed Fetus [De Formato Foetu]. A Facsimile edition, with an introduction, a translation, and a commentary by Howard B. Adelmann, Professor of Histology and Embryology, Cornell University, New York. Cloth. Price, $12. Pp. 883, with illustrations. Ithaca, New York: Cornell University Press; London: Oxford University Press, 1942.

This is an important historical document in biology. It is heartening in these days to see it published in a style worthy of the scholarship and labor that have been devoted to its preparation. Fabricius was the first comparative embryologist after Aristotle and he prepared the first published figures of the development of the chick. In addition to masterly translations and commentaries, Dr. Adelmann has written a series of brilliant essays on the intellectual background, the mode of thought and the achievements of a leading physician and investigator of the sixteenth century. A detailed comparison of Fabricius and William Harvey as embryologists gives him the opportunity of tracing the influence of one great mind on another. It has become customary to praise Harvey as an investigator to the disparagement of the teacher to whom he owed so much. This is due partly to the fact that in some cases it has turned out that Harvey was right and Fabricius wrong, but a contributing factor lay in the difficulty of finding out what Fabricius intended to say. This work gives us an authoritative interpretation of his rather obscure Latin in the light of his sources and his figures. Adelmann concludes that "both were good observers, both authoritarians and it is difficult to decide whether or not Harvey, in his work on generation, succeeded more fully than his master in throwing off the shackles of tradition." Dogma inherited from the Greeks influenced their thinking more than it does ours, but we may well ask whether they were much more fettered and blinded by authority than we are today by current fashionable theories. Their work represents the acme of naked eye embryology.

The account of Fabricius's life includes an intriguing picture of medical teaching at the end of the sixteenth century. Fabricius eventually became professor supraordinarius both of anatomy and of surgery. As his titles and fame increased, his relations with the students deteriorated. The *Acta* of the 'German Nation' record many difficulties particularly in connection with the pompous and ceremonial public anatomic demonstrations. Fabricius's most significant teaching was reserved for selected groups in his own home.

The translations are the first that have been made in any language. They include references to the parallel passages in Harvey. The quotations from the De Generatione Animalium are taken from the rare contemporary translation which gives one the impression of reading Harvey's own colorful English. The reproductions of texts and plates leave nothing to be desired, and the Cornell Press may well be proud of this piece of bookmaking. There are 134 pages of notes in fine print which include many gems from the author's historical researches. The bibliography of 332 titles includes all of Fabricius's works and all the editions and is followed by a most helpful and complete index. Dr. Adelmann is a distinguished experimental embryologist and a scholar deeply read in the philosophy of biology. There are but few nowadays who are competent and fewer who would be willing to devote years to a labor of love such as this is.

Fractures. By Paul B. Magnuson, M.D., F.A.C.S., Associate Professor of Surgery, Northwestern University Medical School, Chicago. Fourth edition. Cloth. Price, $5.50. Pp. 511, with 319 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1942.

As a textbook for surgeons and practitioners, this should satisfy three requirements: the author's large personal experience, so that he may speak authentically as well as learnedly; his wise and unbiased selection of other men's contributions, based on a sense of responsibility equally keen for acceptance and for rejection; and, finally, that pedagogic ability which brings forth clearness in presentation, emphasis on essentials and, above all, responsibility for giving the reader definite and specific answers to specific questions. Dr. Magnuson's book ought to pass favorably on all three counts. It is practical, it is based largely on personal experience, it contains just enough of the basic facts of anatomy and pathology to support the rationality of his treatment. For instance, in the chapter on fractures of the humerus and femur we find no profusion of methods; the author prefers traction methods, he describes them accurately, he does not spare details, and he gives abundant and clear diagrammatic illustrations and supports them with sufficient presentations from his own practical experience. This should be considered good pedagogy. In the present edition some additions have been made in the interest of the war effort. Transportation of the fractured is given more space, also chemotherapy and primary wound treatment in compound fractures. The chapter on standard emergency equipment is better elaborated, as is also the chapter on exercise treatment of fractures and physical therapy. The book is simple and direct in its presentation, and the author should be credited with avoiding useless controversial features by offering only well tried and reliable methods. The diagrams are clear and distinctive, the drawings instructive, and the x-ray films for the most part of more than average quality.

The Kenny Concept of Infantile Paralysis and Its Treatment. By John F. Pohl, M.D., Clinical Assistant Professor of Orthopedic Surgery, University of Minnesota, Minneapolis, in collaboration with Sister Elizabeth Kenny. With a foreword by Frank R. Ober, M.D., President, American Orthopedic Association. Cloth. Price, $5. Pp. 366, with 101 illustrations. Minneapolis & Saint Paul: Bruce Publishing Company, 1943.

For some time physicians and physical therapists have wanted a clear exposition on the Kenny method of treatment for infantile paralysis. The original book by Sister Kenny did not answer the many questions now answered by Dr. Pohl. However, the question of records is still avoided.

Chapter I is a clear explanation of the symptoms as interpreted by Sister Kenny. It is well written and understandable if read with an open mind. Chapter II deals thoroughly with muscle spasm and succeeds in illustrating the symptom. More and better illustrations, especially of the back and shoulder, are needed. How little and fleeting spasm may be should be stressed. Chapters III and IV on the nursing care should be studied by all responsible for the care of patients in the acute stage; chapter IV is well illustrated. Chapter V is quite orthodox. There is no place for the respirator because it increases the muscle spasm. This should be stressed because the public mind has been trained to think of the respirator. Chapter VI, on stimulation of alienated muscle, is the weakest chapter. Muscle stimulation is one of the most difficult parts in the art of the Kenny treatment. It is difficult to teach. More and better illustrations are needed. Chapter VIII is a clear exposition of Sister Kenny's teaching regarding muscle function and typing. This can be accepted for the purpose of treatment to achieve gross motor action. It does not detract from the careful work of Beevor, Sherrington, Wright and others on this

subject. Several departures have been made from the pamphlet previously distributed. It is a healthy sign that the concept is undergoing some change. Chapters IX to XV deal with the details of muscle function. These chapters are used as reference by the technicians. A listing of muscles likely to be incoordinated would be helpful.

Dr. Knapp's commentary is cautiously written. He attempts to support the concept with the known facts and does so well. This book is to be studied. It is well indexed and the material wanted is easily found. The technician can and should use it daily. One must agree with Dr. Ober's "belief that this book should be perused and used by all interested in the welfare of those afflicted with poliomyelitis."

The Human Hand. By Dr. Charlotte Wolff. With a preface by Dr. William Stevenson. Cloth. Price, $3. Pp. 198, with 24 illustrations. New York: Alfred A. Knopf, 1943.

This purports to be a scientific answer to the age long question Is there anything in palmistry? So far as the text goes the reviewer does not feel that an answer has been given. Some evidence is given to indicate that certain types of hands are found more commonly in the case of the insane than in the case of the sane. Perhaps the most satisfying evidence is to be found in the statement made by Dr. William Stevenson, assistant director at the Institute of Experimental Psychology at Oxford, to the effect that Dr. Wolff was able to give good readings of character when she was able to see only hands, thrust by the owner through holes in a heavy curtain. Naturally it is only evidence of this type that can have any value. Better yet perhaps would be estimates of the personalities made solely from prints of hands submitted through umpires of such standing in the scientific world that their conclusions would be respected. About all this book has done for the reviewer is to supply him with information about types of hands. There isn't much on actual correlations between types of hands and types of men and women. It would seem that years of research should have enabled Dr. Wolff to bring forth more evidence than she presents in this book. Actually, if scientifically trained men and women are ever to be convinced that there is something in palmistry the proof will have to come from disinterested scientists who will see how many hits and, more important, how many misses are registered by a good palmist who has to base reports on an analysis of scores of hand prints identified only by numbers. A one page report on such a study would have immensely more value than this book has.

An Atlas of the Basal Ganglia, Brain Stem and Spinal Cord Based on Myelin-Stained Material. By Henry Alsop Riley, M.A., M.D., Professor of Neurology and Neuroanatomy, Columbia University, New York. Fabrikoid. Price, $13.50. Pp. 708, with illustrations. Baltimore: Williams & Wilkins Company, 1943.

This atlas consists of series of excellent photographs of sections of the basal ganglions, brain stem and spinal cord stained with Weigert-Pal technic for myelin. Series are presented of sections cut not only in the usual transverse manner but also horizontally and sagittally. The photographs are well chosen and well reproduced. There are a few minor irritations. The lettering on the photographs is in capital letters, while in the corresponding symbols in the legends both capital and lower case letters are used. Furthermore, the spacing in the two places does not always agree. Thus (pp. 214-215) CAROL on the photograph is Car ol in the legend. This is not serious, but as symbols are not arranged absolutely alphabetically in the legends, e. g. C clt precedes Car ol, this tends toward confusion of the reader. In the list of structures, which also serves as an index, it would have been simpler to include the page on which the structure is illustrated. In the list of structures which, with a list of references, concludes the volume, the author has given the name for the structure which he has chosen and its abbreviation, some of the more common synonyms and a brief description of the structure in question. This atlas represents years of painstaking effort. It will prove to be a most valuable reference work particularly to neurologic investigators and advanced students. Although other atlases have been published, nothing as complete, detailed and extensive as this volume previously existed.

Outline of Roentgen Diagnosis: An Orientation in the Basic Principles of Diagnosis by the Roentgen Method. By Leo G. Rigler, B.S., M.B., M.D., Professor of Radiology, University of Minnesota, Minneapolis. Second edition. Fabrikoid. Price, $6.50. Pp. 196, with 254 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1943.

The completely rewritten second edition of this work follows the plan of the original edition. In nine sections the systems of the body are considered with regard to their roentgen examination. A preliminary section on general principles of roentgen diagnosis is an adequate introduction to the subject matter; physics and the technic of taking films are deliberately omitted. A final section dealing with miscellaneous topics completes the written portion of the book. There is adequate cross filing of diseases which can be diagnosed in more than one system, as well as a paragraph at the end of each chapter analyzing the value of the examination under consideration. The sixty-one page pictorial atlas, which follows an exhaustive index, is apparently the same group of plates as in the first edition. It is composed of well selected reproductions of films and original drawings of real merit. On the page opposite each group of plates are notes and identification of the labels on the plates. The author's preface is precisely correct in saying that it is "intended as an outline for the teaching of roentgen diagnosis." This small textbook is designed for the student and comprehensively covers the fundamentals of diagnostic roentgenology. Its orderly presentation in outline form is especially helpful in an introductory course. It is highly recommended, particularly in line with the appearance of a few smaller textbooks written for students.

Mental Health in College. By Clements C. Fry, M.D., Psychiatrist to the Department of University Health, Yale University, New Haven, with the collaboration of Edna G. Rostow, Research Assistant in Psychiatry and Mental Hygiene, Division of College Psychiatry and Mental Hygiene, Yale University. Cloth. Price, $2. Pp. 365. New York: Commonwealth Fund: London: Oxford University Press, 1942.

At Yale University, service in mental hygiene for students began in 1925. A few years later a division of college psychiatry and mental hygiene was organized in the department of university health. The study of a decade of experience with students who consulted this division is presented in the book. The preface traces organizational details and is followed by a general consideration of psychiatric problems presented by Yale students and of the case histories discussed in the book. Next, problems of personality growth, more particularly family relationships and sex problems, are taken up. The reactions to the undergraduate environment are reviewed with reference to the undergraduate scholastic problems and social adjustment. Finally, special problems presented by the graduate and professional schools, as well as by serious disorders, are analyzed. The book illustrates that mental hygiene is a highly important part of health service for college students. It will interest those concerned with personality problems of college students—deans, student counselors, physicians and, of course, also parents.

The Parasites of Man in Temperate Climates. By Thomas W. M. Cameron, Professor of Parasitology, McGill University, Montreal. Second printing. Fabrikoid. Price, $3. Pp. 182, with illustrations. Toronto, Canada: University of Toronto Press; London: Oxford University Press, 1942.

This small book is intended for the practicing physician in the temperate climate of North America. It briefly reviews the parasites which are commonly encountered in that area, giving necessary information concerning the diagnosis and treatment. There are good sections on amebiasis, malaria, pinworms, trichinosis, hookworm, hydatid disease and lice and fleas, with lesser paragraphs on other infestations. Attention is paid to certain of the tropical parasites which might be imported from warmer climates. The book is well illustrated with drawings and photographs. It should serve a useful purpose.

Imágenes radiológicas pulmonares micronodulares. Por Francisco Martínez. Tesis de profesorado. Paper. Pp. 47, with 51 illustrations. Buenos Aires: Sebastián de Amorrortu e Hijos, 1942.

A survey on a variety of conditions giving radiologic pictures analogous to the type whereby miliary tuberculosis is recognized. The reproductions of the x-ray plates are fair and clearly illustrate the concepts of the text.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TYPHOID VACCINATION AND TUBERCULOSIS

To the Editor:—**Is typhoid vaccine contraindicated in clinically active tuberculosis? Is it contraindicated in arrested tuberculosis?**

J. D. Riley, M.D., State Sanatorium, Ark.

ANSWER.—Any insult to the constitution of a patient suffering from active tuberculosis without a compensatory beneficial effect will be detrimental. As typhoid vaccination sometimes produces severe reactions and as beneficial effect on tuberculosis has never been claimed, it follows that it will probably result in injury which may lead to serious results. Although Baldwin and L'Esperance failed to show any particular damage in guinea pig experiments following typhoid vaccination, Clovis and Mills reported the production of acute pleurisy resulting from its use in tuberculous patients. There is every reason to believe also that it will produce irritation and exudation elsewhere in the body of tuberculous patients. In a report by Hektoen and Irons, who canvassed 267 American specialists in tuberculosis, there were over 3 to 1 who claimed unfavorable over favorable results on the use of different "vaccines" (not counting products of the tubercle bacillus) in tuberculous patients. Although the vaccines were intended for the "secondary infections" and were not "typhoid," the principles are similar if not identical. Of the favorable claims made to these authors only vague "good results" were reported, while from those reporting unfavorable results five deaths were directly attributable to "mixed stock vaccines."

For quiescent, latent-active or "arrested" tuberculosis it would seem that the same general rules should apply. There is a period of years when the bacilli are being encapsulated, when a sudden exudative reaction may cause a softening and exacerbation of the lesion.

In the population there is a large number of infected people who are either drifting toward disease or toward recovery when a rupture of an encapsulated tuberculous node or tubercle into the tissues or into one of the canals may lead to active and even fatal disease. There are many "accidents and shocks of life" which have been found to precipitate disease in such patients, not the least of which is typhoid vaccination. In the writer's experience activity has been precipitated in two definite instances by typhoid vaccination. Hench also reports a few random cases of exacerbation of tuberculosis following typhoid vaccination.

It seems prudent, therefore, to refrain from vaccination against typhoid in all cases of active tuberculosis and in all latent-active cases (such as those the Army and Navy reject for tuberculosis) except where the danger of typhoid itself greatly outweighs the probability of active tuberculosis. An example of the latter condition is afforded by invaded countries or bombed cities where enteric diseases may be rampant.

References:

Baldwin, H., and L'Esperance, E. S.: The Influence of Typhoid Vaccine on Tuberculous Guinea Pigs, *J. Immunol.* **2**: 283 (April) 1917.

Clovis, E. E., and Mills, G. E.: Effects of Typhoid Fever and Typhoid Vaccine on Pulmonary Tuberculous, THE JOURNAL, Jan. 31, 1920, p. 297.

Hektoen, Ludvig, and Irons, E. E.: Vaccine Therapy, *ibid.*, March 16, 1929, p. 864.

Hench, Philip S.: Usual and Unusual Reactions to Protein (Fever) Therapy, *Arch. Int. Med.* **49**: 1 (Jan.) 1932.

FLUORIDES AND DENTAL CARIES

To the Editor:—**What type of fluorine and what dose is necessary to use as a preventive of tooth decay?** **Lieutenant Colonel, M. C., A. U. S.**

ANSWER.—There is a large amount of epidemiologic evidence suggesting that an optimal intake of fluoride tends to inhibit the intensity of dental caries attack. In this country differences in dental caries prevalence rates have been found associated with differences in the fluoride concentration of several municipal water supplies studied. In what particular form the fluorine is present naturally in these waters has not been satisfactorily demonstrated but experimentally several of the salts of fluorine (sodium fluoride, calcium fluoride and others) have been shown definitely to inhibit induced caries in rat molars.

The specific dosage most useful in inhibiting dental caries attack in man has not been definitely determined. A paper by F. J. McClure, recently accepted for publication by the *American Journal of Diseases of Children*, entitled "Fluoride Ingestion and Dental Caries—Quantitative Relations Based on Food and Water Requirements of Children 1 to 12 Years Old," may answer theoretically some of the questions raised in connection with the problem of dosage or fluoride intake.

On the basis of epidemiologic studies made in eight suburban Chicago communities (*Pub. Health Rep.* **56**:761 [April 11] 1941) it would seem that the most desirable fluoride concentration in a domestic water from the standpoint of dental health, is one containing about one part per million of fluoride (F). It is, of course, likely that in some regions of the United States, for instance the Southwest, where climatologic conditions such as high mean annual temperature, humidity and wind velocity may introduce factors conducive to a higher water consumption and consequently higher fluoride intake, low dental caries prevalence rates may be found associated with the continued use of domestic waters well below one part per million. A specific answer to possible climatologic influences, however, must await the results of a number of detailed epidemiologic studies in different parts of the country in cities having the requisites for quantitative evaluation. The probable influence of this variable, therefore, must be kept in mind; a relatively precise estimation of its influence must await the results of further study.

The control of dental caries attack through the medium of internally administered fluoride has not as yet been subjected to a controlled test; no information, therefore, is available with regard to whether fluoride administered in this manner will or will not reduce the incidence of dental caries.

MANUFACTURE INVOLVING FORMALDEHYDE COMPOUND

To the Editor:—**A local manufacturer of wallboard is contemplating the manufacture of a new product which involves the application of a formula consisting of urea, formaldehyde and ethylene glycol. This formula will be painted on the rough board and then subjected to heat in a closed oven and later to certain presses. The question arises as to the danger to employees from inhalation of fumes from this mixture and the possible danger to residents surrounding the factory from the escape of fumes into the atmosphere from the oven. I have no literature available locally on which to base an opinion as to the harmful effects which might result from the inhalation or contact with these fumes. Can you give me any information available on this subject and, if they are harmful, any suggestion as to means of protecting the workmen handling this mixture and also the escaping fumes from the factory.**

Archie Orenstein, M.D., Hilo, Hawaii.

ANSWER.—This query lacks some items of information necessary for a satisfactory answer. It is not clear that the urea-formaldehyde combination represents one of the well known urea-formaldehyde condensation resins or instead a loose mixture along with ethylene glycol, which possibly are chemically combined in the product itself as a result of heat and pressure. Further, the extent of operation is not clear, which fact is important to the scale of community atmospheric pollution. In any event the formaldehyde is the item for chief practical consideration. There is every reason to believe that enough formaldehyde may be present to constitute objectionable or damaging work conditions within the factory unless the operations mentioned are carried out mechanically in enclosed systems, which is highly desirable. The threshold of beginning injury from formaldehyde is about 10 parts of the gas per million of air. Above that level, and more particularly above the level of 20 parts per million, respiratory irritation may be expected, which in severe form is characterized by bronchitis and at times respiratory tract abscesses. Skin contact with almost any material containing formaldehyde may lead to dermatitis. The situation will be less troublesome if in fact a preformed urea-formaldehyde synthetic resin is employed. No casual protection such as that from respirators would be sufficient in case considerable volumes of formaldehyde gas are present. Full consideration should be extended to the merits of well ventilated automatic operations. Apart from the fabrication of the products, some possibility exists that sawdust from later shaping of the wallboard may lead to skin irritation.

As to the community situation, some benefit may arise from the passing of the entrained gases through a water screen or sprinkler system, since some of the gases evolved are readily dissolved in water and may be discharged into waste systems. Assuming the provision of fairly high stacks, the dilution of the formaldehyde would be so great as to eliminate community hazard, but odors probably would arise. Formaldehyde odors are disturbing to most persons. A somewhat analogous situation exists in connection with the fabrication of bakelite products, bakelite being a phenol-formaldehyde resin. While no real damage is done, disturbing odors are sometimes encountered for several blocks down wind. Both in the factory and in the

general atmosphere it will be necessary to maintain conditions as to formaldehyde below the 10 parts per million level. Measurement procedures may be found in an article by Barnes and Speicher in the *Journal of Industrial Hygiene and Toxicology* 24:10 (Jan.) 1942.

EFFECT OF ESTROGEN ADMINISTRATION IN EARLY PREGNANCY

To the Editor:—A white woman aged 30 was brought to me by police eighteen hours after having been raped. She expected to menstruate in fifteen days. The legal questions and the question of prevention of disease are not difficult to handle, but the question of the prevention of pregnancy, entirely apart from the moral aspect, has confused me and led to violent disagreement among my friends. I was advised to give large doses of estrogenic substance 50,000 units in oil daily for the three days prior to her expected period and on the day of the expected period to give quinine and castor oil. As menstruation may be due to withdrawal of estrogen, it can be argued that this is not logical. I have decided, partly on moral grounds, to do nothing but wait and see; nevertheless the paucity of information on this question irritates me. Textbooks and the literature seem to avoid the point deliberately. What can be expected if large doses of estrogen are given to a nonpregnant woman immediately prior to her expected menses? If they are given to a pregnant woman prior to the date on which, should she not be pregnant, she would have menstruated? If they are given to a woman during the early months of pregnancy? I should also like to know, in the consideration of similar situations, how the possibility or probability of pregnancy can be estimated.

M.D., Maryland.

ANSWER.—Large doses of estrogenic substance given to a nonpregnant woman immediately prior to her expected menses will usually have no effect on the ensuing period, since once the menstrual cycle is in full swing the rhythm is hard to upset. On the other hand, when large doses of estrogenic preparations are administered in the first half of the cycle and continued throughout, the next menses are often delayed. Thus Zondek (THE JOURNAL, May 11, 1940, p. 1850) has been able to postpone menstruation from seven to seventy days in this way; the dose necessary for bringing about such an effect is at least 70,000 international units. This inhibition of menstruation, it is believed, results from the fact that the estrogen blocks the gonadotropic action of the anterior pituitary, whereby the development of the corpus luteum and production of progesterone are prevented. Consequently the uterine mucosa cannot develop and progestational transformation does not occur.

Whether the administration of estrogens to a pregnant woman between the time of conception and her first missed period would prevent implantation by disrupting the preparation of progestational endometrium (as described in the query) is not known. When given in pregnancy after the first missed period, even large doses of estrogen are completely ineffectual in interrupting pregnancy.

Since rape occurred in this case about the time at which ovulation would normally have taken place, that is fifteen days before the next menstruation, the probability of pregnancy is good. The moral issues concerned in a problem of this kind depend so much on the circumstances of the individual case that generalizations are impossible.

UVULECTOMY

To the Editor:—Is the operation of routine uvulectomy with tonsillectomy and adenoidectomy considered good practice? Is it an accepted procedure? Would it be free from a malpractice suit? Would the anesthetist giving the anesthetic be involved in such a suit? The uvulas being removed are perfectly normal.

M.D., Washington, D. C.

ANSWER.—The operation of routine uvulectomy (staphylectomy) with tonsillectomy and adenoidectomy is not considered good practice. It is not an accepted procedure. Abstracts of a number of court cases have been published in THE JOURNAL in which physicians have been sued for malpractice based on the removal of the uvula, or a part of it, during tonsillectomies:

Schmidt v. *Stone*, 194 N. W. 917, abstracted in THE JOURNAL, March 15, 1924, page 915.

Govan v. *McCord*, 11 P. (2d) 141, abstracted in THE JOURNAL, Jan. 14, 1933, page 140.

Shuffield v. *Taylor*, 83 S. W. (2d) 955, abstracted in THE JOURNAL, Jan. 4, 1936, page 72.

Thomsen v. *Burgeson*, 79 P. (2d) 136, abstracted in THE JOURNAL, April 1, 1939, page 1291.

The foregoing cases are evidence of the possibility that suit may be instituted against a physician who removes the uvula during a tonsillectomy without the knowledge and consent of the patient. An anesthetist normally is not legally responsible for the dereliction of the operating physician. Where a uvula is so large as to give symptoms of pharyngeal discomfort, cause cough or otherwise irritate the fauces and pharynx or interfere mechanically with the functions of breathing, swallowing and nutrition, the exact condition of the uvula should be positively determined. Inflammatory, specific, neoplastic, indurative, infiltrative and degenerative states of the uvula must be proved so that the physician in attendance and in charge of the patient will be able to discuss the condition with the patient's parents or with the patient himself, if he is an adult past his majority, and to state specifically just what he proposes to do to the uvula during the operation. There are certain instances when a partial uvulectomy is warranted, but the consensus of rhinolaryngologic opinion throughout the world is to leave a normal uvula alone. This brings up another point that happens every now and again in practice. A portion of a normal uvula may be inadvertently nipped during the time the tonsils are removed and not infrequently the entire uvula has been snared off. The latter surgery is unfortunate and should be considered an accident and, though no deleterious effects have been particularly noted, it is a practice to be studiously avoided. If during the course of a tonsillectomy a portion or an entire uvula has been severed inadvertently, the parents or guardian should be told about it and a complete explanation given. Uvulectomy has been performed inadvertently by skilful laryngologists as the result of dense adhesions that may have not been completely divided or dissected. The normal uvula should be left alone; the abnormal uvula should be treated according to indications.

"SCRUB" DERMATITIS—POSSIBLE SENSITIVITY TO FORMALDEHYDE AND RUBBER

To the Editor:—I have been suffering from a so-called scrub dermatitis since 1935. Clinically I am sensitive to formaldehyde, although patch tests are inconclusive. In 1935 I spent many days in the cystoscopic room wearing gowns sterilized in formaldehyde vapor cabinets. The gowns fitted snugly about my wrists under rubber gloves. The onset of the dermatitis was about my wrists but later extended to the backs of the hands and forearms. After the acute episode of three or four months the dermatitis took a mild and intermittent course, but during the past year it has been present almost continuously. I found crude tar effective at first but later it became irritating. It responds most favorably to x-rays. Elimination of the common foods known to be allergenic has not been helpful. The past several years I have used nothing but Duke's basic soap for scrubbing, which has been of some value, and recently I have been using sulfonated oil to replace all soap without real benefit. I have not eliminated formaldehyde and still use a formaldehyde vapor sterilizing cabinet for cystoscopic instruments. In the past month or two I have developed a contact dermatitis over the right eye where the bakelite ocular of the cystoscope rests during cystoscopic procedures. Instruments are always washed with sterile water after being removed from the formaldehyde cabinet. Recently I have tried neutralization by immersing the instruments in a diluted hypochlorite (½ per cent Dakin's) solution before putting them through the sterile water bath.

I wish to continue vapor sterilization of cystoscopic instruments if at all possible because of the convenience of this method. Is there any other antiseptic vapor which could replace formaldehyde? If not, is there any better way to detoxify the formaldehyde? Does the bakelite ocular of the cystoscope absorb the formaldehyde vapor and, if so, would a metal ocular solve this particular problem? If it becomes necessary to eliminate the formaldehyde cabinet and go to liquid sterilization, what solution would give adequate sterilization yet be the least irritating to the skin? I understand that Bard-Parker's solution contains formaldehyde. Assuming that scrubbing and soap play a part, do you have any suggestions in this respect? What part might rubber gloves play and, if important, how could the gloves be treated to remove the irritant properties? Would attention to vitamins or diet be of any value? What sequels might be anticipated in continuing x-ray therapy, which is now effective?

M.D., Nebraska.

ANSWER.—Formaldehyde is not only a primary skin irritant but is one of the most powerful sensitizers, and many physicians as well as laboratory technicians are highly sensitive to it.

No cold vapor other than formaldehyde is used to disinfect instruments.

Formaldehyde can be oxidized with an oxidizing agent like hydrogen peroxide, sodium perborate or potassium permanganate in solution.

Bakelite, if porous, may absorb considerable formaldehyde vapor.

A metal ocular would not absorb any at all.

The best sterilization method that would be least irritating to the skin is to use a steam sterilizer. If one does not wish to install a steam sterilizer it is suggested that the instruments be soaked in a 1 per cent solution of saponated solution of cresol for fifteen minutes, dipped into alcohol and then in sterile water. Another method is to dip the instruments into 1:1,000 Zephiran for fifteen minutes and then in sterile water. (Zephiran is an alkyl dimethyl benzyl ammonium chloride.)

If soap and scrubbing play a part, it is suggested that the following formula be used instead of soap:

Sulfonated castor oil	90.
Duponol W. A. pure	2.
Castor oil (unsulfonated)	8.
	100.

This makes a superfatted soapless detergent.

Dermatitis from rubber gloves is frequent among surgeons. It is caused most of the time by sensitivity to the accelerators and antioxidants, which are taken out of the glove by perspiration. Soaking the gloves for fifteen minutes in a 5 per cent solution of sodium carbonate followed by washing in water to remove the carbonate and then sterilizing by dry heat and wearing dry gloves, using plenty of powder, has in many instances made it possible for surgeons to wear rubber gloves when previously they have not been able to do so. The treatment of the gloves removes the excessive accelerators and antioxidants which otherwise would be removed by the perspiration.

Attention to vitamins or diet has not been proved to be of any value in cases such as that described.

Too much x-ray treatment may cause x-ray dermatitis and cancer.

VESICULAR ERUPTION AND CHIGGERS

To the Editor:—We have in northeastern Texas a considerable number of insect bites which present a perplexing problem. The lesion at first is a small area of inflammation comparable to a mosquito bite and is most often seen on the lower extremities, but no portion of the body is exempt. It appears immediately after exposure and within eighteen to twenty-four hours becomes a vesicle ranging in size from 0.3 to 1 cm. in diameter at the base and raised 0.1 to 0.5 cm. The entire lesion causes moderate itching, and a break in the wall with an escape of the contents causes extension of a reddened area to the surrounding portion. The lesion after an evacuation of the contents follows normal healing trends and becomes completely healed within ten days. My impression is that this lesion is a result of a dermatitis venenata combined with the bite of a chigger. If you can aid me to arrive at a diagnosis from my description and give me the best treatment for the condition I should appreciate it. Is there any insect which is called a blister bug? Lieutenant, M. C., A. U. S.

ANSWER.—The chigger is a larval arachnid and not an insect. It most commonly invades the host by progressing upward from the feet until it meets an obstruction such as a garter, and there it usually attaches itself to the skin in the same manner as a tick. Its salivary secretion is an irritant and produces an intensely itching erythematous papule as large as a pea or a small coin, which does not appear, as a rule, until several hours after the bite has been inflicted. By that time most of the chiggers have become engorged and dropped off, so that they are difficult to find. The lesion is usually a papule, but it may be capped by a small pinhead size central vesicle, which may be hemorrhagic. The papule may persist for ten days or longer. No blister bug is known; possibly that name might be applied to the chigger in some districts. Lesions of dermatitis venenata are not likely to resemble bites. They occur as irregular erythematovesicular patches and the vesicles may be large. Itching chigger bites may be relieved by a bath followed by the application of 70 per cent alcohol, after which the official boric acid ointment plus 1 to 2 per cent phenol and 0.2 per cent menthol may be applied, the excess wiped off and talc dusted over the surface. The bath should be repeated daily and the applications at least three times a day. Scratching must be avoided. Infestation with chiggers may be prevented by dusting powdered sulfur on the legs and ankles before going into the field.

CIRCUMSCRIBED PIGMENTED MACULES ON LIPS

To the Editor:—A woman aged 35 has developed within the last three months in Florida a pigmented spot in the vermilion border of the lower lip quite close to the median line. The spot consists of fine, dark dots, probably corresponding to tips of papillae. Since the patient is a heavy cigaret smoker she attributed this spot to that. I should have thought so myself had I not had an exactly parallel case in a woman about the same age who developed such a dark spot in the same place without smoking at all. This woman was pregnant when the spot developed. Some years ago I saw a man with such a black spot in the lower lip. He used to smoke gold tipped cigarets and at that time I blamed that for it, thinking of a local metal mark similar to argyrosis. Do you know anything about the significance and treatment of these spots, especially whether they have to be considered as precancerous conditions or not? There was neither inflammation nor keratosis in any of the cases. Kurt Wiener, M.D., Milwaukee.

ANSWER.—Circumscribed pigmented macules on the lips may be freckles, senile freckles, chloasma or superficial pigmented nevi. The differential diagnosis is difficult even after careful examination. The presence of other lesions on the face or elsewhere might be of help; but it is inferred from the query that none were found. Tobacco or gold tipped cigarets cannot be held responsible. Exposure to strong sunlight in the one case or the pregnancy in the second is a more likely cause. The only one of these four possibilities that might eventuate in carcinoma is the second. These, seen most often on the backs of the hands, sometimes become senile keratoses but may persist for many years without undergoing any such change. They should be protected from strong light, from exposure to the weather and from other irritation. The daily application of an emollient such as equal parts of wool fat and cold cream is of value.

POSSIBLE LYMPHOID TISSUE HYPERTROPHY IN NASOPHARYNX

To the Editor:—A youth aged 17 had a tonsillectomy and an adenoidectomy at 4 years of age. In the early postoperative visits the surgeon introduced his finger into the nasopharynx "to break down the adenoid tissue." Shortly thereafter the child developed a "hawking." This has persisted up to this moment despite intermittent treatment with mild protein silver packs, nasal instillations and the use of vitamin A preparations. The "hawking" comes on fairly regularly one to two hours after the patient has fallen asleep, persists for three to four minutes and is loud enough to shake the rafters. He is not troubled during the rest of the night or at any time during the day. He is otherwise healthy and well developed. A laryngologist has called it "granular pharyngitis." What can you suggest by way of treatment? Captain, M. C., A. U. S.

ANSWER.—A careful search for lymphoid elements in the nasopharynx should be undertaken in addition to a thorough check-up of the nose, accessory sinuses, oropharynx, laryngopharynx and larynx.

The treatment will be based on the diagnosis. If hypertrophic lymphoid elements are found in the pharyngeal vault they can be removed by surgical measures or, if solitary follicles are noted on the postpharyngeal wall, electrocoagulation will prove the quickest method of dealing with them. Smaller lymphoid structures on the vault or in and around Rosenmüller's fossae might require the aid of a radiologist thoroughly grounded in the principles of applying radium or x-rays in accurate dosage and at proper intervals. Recent advances along these lines have been brought forth by S. J. Crowe of Baltimore and others.

Lymphoid hypertrophy in the laryngopharynx might be present and should be dealt with by surgery or electrocoagulation.

Septal irregularities, spurs, ridges, hypertrophies and hyperplasias, when found, require surgical correction in order to establish good intranasal mechanics.

Catarrhal and/or suppurative states in the nasal accessory sinuses should be treated by conservative means to promote aeration and drainage, for many cases of pharyngitis have their cause in a focus higher up and by gravitation of infected material from any group of sinuses down the nasopharynx reinfect and reirritate lymphoid structures in the naso-oropharynx and laryngopharynx, evoking some of the symptoms described in the query. Nasal shrinkage, instillations, applications, packs, irrigations and displacement therapy after the method of A. W. Proetz of St. Louis will aid in the functional improvement of the nose and nasal accessory sinuses, and application of astringents to the pharynx will help "burn down" the lymphoid hypertrophies.

All measures calculated to establish the highest degree of health should be diligently carried out. Metabolic faults and alterations in the blood, glandular and other systems should be corrected as quickly as possible so that a balanced state of bodily economy may be maintained and retained.

PHYSIOLOGIC DISTURBANCES ACCOMPANYING SHOCK

To the Editor:—In connection with the syndrome of traumatic shock, is there a difference in hemoconcentration between peripheral capillary blood and venous blood? In other words, would hematocrit and red blood count and hemoglobin determinations vary between these two sources of blood in a case of this syndrome? Would you kindly refer me to recent sources where I might obtain descriptions of the physiology and treatment of this condition? M.D., New York.

ANSWER.—In the early stages of traumatic or secondary shock, before the systolic blood pressure has declined below 80 mm., there is little difference between the concentration of the blood in the capillaries and that in the veins and arteries. In later stages, stasis of blood develops in varying degrees in the capillary bed in different systemic areas. In such areas the concentration of the blood is greater than in the circulating blood, either venous or arterial.

The literature bearing on the physiologic disturbances which accompany shock has been reviewed and summarized in Shock, Its Dynamics, Occurrence and Management by V. H. Moon (Philadelphia, Lea & Febiger, 1942). The same work deals with clinical problems and management. The National Research Council has sponsored a military surgical manual on Burns, Shock, Wound Healing and Vascular Injuries, published by W. B. Saunders, Philadelphia, 1943.

PILONIDAL CYST AND CANCER

To the Editor:—In the Jan. 18, 1941 issue of The Journal there is a question with regard to pilonidal cysts and cancer submitted by Dr. E. V. Andrew of Maquoketa, Iowa. The answer submitted stated that no report in the literature of cancer developing in a pilonidal cyst had been found. This makes me feel a little guilty, because several years ago at St. Luke's Hospital I removed an innocent looking pilonidal cyst from a young man, and the pathologic report came back as squamous carcinoma. I have meant to report this case but just never got around to it. Incidentally, although the operation was done on Nov. 9, 1937, the man is still well in every respect. Will F. Lyon, M.D., Chicago.